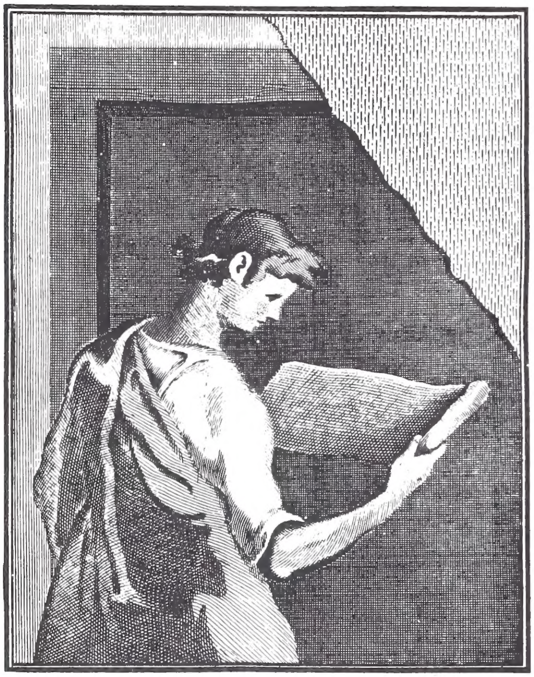

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# THE BRITISH
# JOURNAL OF PHOTOGRAPHY.

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## THE PAST YEAR.

It is reported of the ancient Athenians and the "strangers" who resided in Athens that they "spent their time in nothing else but either to tell or to hear some new thing." Now there is among photographers a slight trace of this feeling—such a trace as prompts visitors to the office of this Journal to make the first question, after the usual greetings, "What's new?" The inquiry thus made, having only a bearing on the novelties of the week just past, may here fitly be put, but with a more extended retrospective application, the commencement of a new year being a suitable time to glance retroactively, with a view to ascertain what has been achieved during the past twelve months.

Commencing at the close of the year, the great value of photography as a handmaid to astronomical science has been most triumphantly proved on the occasion of the observation of the recent transit of Venus. This introspection is something decidedly similar to the taking of a stereoscopic photograph, in which the two lenses by which the picture is to be taken are placed a certain distance apart from each other, each one thus seeing the objects to be photographed under slightly different conditions. Precisely the same thing was done when photographing or observing the transit of Venus across the sun's disc; but, instead of the lenses of the camera being separated only by a few inches, they are here separated by as great a distance apart as the comparatively small diameter of the earth will permit, but all stations being in exact chronometric *rapport* with each other. In this way observations have been made, and numerous photographs taken, at many stations, the results of which, when all the observations shall have been collated and the conclusions deduced, will be that we shall acquire a better knowledge respecting the distance of the sun from the earth, and hence of its dimensions, than was formerly possessed.

During the short period the collodion pellicle of Mr. W. B. Bolton has been on its trial it has been proved to be a step in advance, the importance of which is only beginning to be adequately realised. Unlike some other processes ushered into existence in a mysterious and incomplete state to be subsequently "tinkered" into a form of practical utility, this process was heralded neither by the sounding of trumpets nor the beating of drums, but was presented to the public through the pages of this Journal in a form so practical that of the numbers who have tried it we have not heard that a single failure has occurred. By this process all washings and preservatives are dispensed with; the sensitive emulsion—which will keep for a long period in its liquid form, and indefinitely when solidified—is poured upon a plate of glass, and the preparation of the plate is by that act completed. The experiments of Captain Fox with this process must also be spoken of in terms of the highest commendation. In adding the oleate of silver to the bromide in the film he finds an accession of great value.

Another dry process, which was first published in these pages, and which, like that just mentioned, is of a revolutionary character, is now making itself known—we refer to gelatino-bromide, originally suggested by Dr. Maddox, who sent several negatives for our inspection at the time. The capabilities of the process have since been proved by Mr. Kennett, who has obtained a degree of sensitiveness quite equal to, if not surpassing, that of wet collodion plates, with the further advantage of having the gelatine pellicle so prepared as to be put up in small dry packets ready for use at any time by the simple addition of water. For this method of desiccating the gelatine to adapt it for tourists or commercial purposes Mr. Kennett has obtained a patent.

While on the subject of dry plates we may observe that during the past year sensitive collodion emulsion like that of Mr. Bolton has been issued by commercial firms, so that as respects facility in the preparation of dry plates very little advance now remains to be made.

The Obernetter process (said to be erroneously so called) of reproducing negatives has received a great deal of attention during the past year. A plate of glass coated with a sensitive mixture known to every careful reader of this Journal is exposed to light in a printing-frame under the negative to be reproduced; finely powdered plumbago is then dusted over the surface of the glass by means of a fine camel's-hair brush, and it adheres to the glass in the inverse ratio of its exposure. Thus from a negative (or a positive) is produced a picture of precisely the same class as the original. As the negative thus obtained is reversed it is necessary to remove the film from the plate by means of collodion when it is to be used for silver printing; but it proves a very valuable boon in connection with carbon printing, for, owing to the reversal of the negative, the single transfer method may be adopted without objection, and without the necessity which previously existed of having to strip the collodion film from a negative and use it in the pellicular form so as to print from the under side. Here it is done ready to hand. Negatives of this reversed character will also facilitate operations in collotypy, Woodbury, and other kinds of mechanical printing, as well as in several branches of photographic engraving.

Taking advantage of the property above indicated of the sensitive mixture employed in reproducing negatives Mr. Werge has proposed, and successfully carried into practice, a method of giving pictorial effect to a negative by adding any desired kind of background to it. This method will obviate much of the necessity hitherto felt for double printing; for, instead of having two negatives—one of a figure, and the other of a landscape or other scene to serve as a background, and employing special masks for each of these negatives—all the effects are here obtained on the one negative, which is then printed without the demand of any more than the usual skill of the average printer.

A more permanent method of printing in addition to that of carbon has long been desiderated. During the past year a process, which apparently possesses great stability, has been discovered by Mr. William Willis. In this the substance of the picture is formed of metallic platinum in a state of fine division. Full particulars, both of the principles involved and the manner in which these principles are carried into practice, were published at the time in this Journal.

In 1871 was commenced a series of annual international exhibitions of which great things were at one time predicated. In these photography was represented each year as a branch of the fine arts, and had the series

of exhibitions survived it would, in the course of another year, have occupied the more prominent position of being represented as an important branch of trade and commerce; but the exhibitions have been brought to a miserable and ignominious end, and it is authoritatively announced that no repetition of the unhappy experiment is to be attempted. Photographers throughout the country appeared not to have had much confidence in those who were appointed photographic commissioners, and hence a poor response was made to the invitations given them to send in their works for exhibition.

The subject of giving auxiliary exposures to the negative plate—either in the form of pre-lighting, post-lighting, or contemporaneous lighting—has formed a fertile theme of debate during the year. Some have found that it enabled them to reduce the time of exposure in the camera by nearly one-half; others allege that they find no advantage whatever to result from the system. The truth will probably be found to lie between the two extremes.

Although not a "novelty," in the strict sense of the word, the method of finishing the surface of prints by friction against a heated burnisher may be said to have been practically introduced into this country during the past year. As we have on a previous occasion expressed our opinion relative to the fine finish imparted by hot burnishing it is unnecessary for us to here again enlarge upon the subject.

## ON THE FADING OF PRINTS, AND A MEANS OF REMOVING FROM THEM THE LAST TRACE OF HYPOSULPHITE OF SODA.

The somewhat startling opinions expressed by Mr. Edward Dunmore, at page 613 of our last volume, on the fading of silver prints, have induced us to recal to the minds of our readers some leading facts which were proved, in reference to this subject, as the result of long and laborious investigations undertaken a few years ago by MM. Davanne and Girard in France, and by Mr. Hardwich, Mr. Sutton, and others in England. These seem to us to point to a conclusion very different from that at which Mr. Dunmore has arrived, and we cannot, therefore, allow his article to pass without editorial comment.

In the first place, then, it has been proved that *un*mounted prints upon *plain* paper sometimes fade and turn yellow. This fact enables us to put on one side the consideration of the putrefactive fermentation of albumen or of the mounting solution as a main cause of fading. This might contribute to the result, but fading may occur independently of it. The problem of the main cause of fading will therefore, be simplified by confining the investigation to unmounted plain paper prints. It will be time enough when we have discovered why *these* fade to turn our attention to the probable effects of albumen, albuminate of silver, &c., in the paper.

But the problem may be confined within still narrower limits by attention to the following facts, which have also been demonstrated:—First, it is found that if a black silver stain upon a piece of blotting-paper be immersed in a solution of fresh hyposulphite of soda, and put away for a few days or weeks, the stain will turn yellow. Evidently, therefore, fading may occur independently of any sizing material in the paper. Secondly, if a calotype negative upon plain paper, which has been developed by gallic acid upon iodide of silver, be placed upon a horizontal support and a large drop of water be allowed to fall upon one of the deepest blacks in it, and into this puddle a crystal of pure hyposulphite of soda, nearly as large as the drop itself, be placed, it will be found, in the course of a few hours, that the black silver stain beneath the drop has become quite yellow, like the faded blacks of a positive print. Lastly, if a similar experiment be made with a collodion negative the same results will occur. These facts afford strong ground for believing that when metallic silver in a state of fine division is placed in contact with a fresh solution of hyposulphite of soda it passes gradually into a peculiar compound which has a pale yellow colour, and which is, in fact, the material of which the shadows of a faded print are composed. In the case of the collodion negative the blacks of the image when polished have all the appearance of metallic silver, whilst the vehicle which contains them—pyroxyline—cannot certainly be considered as putrescible organic matter. No other conclusion, therefore, than that which we have drawn from these facts seems to us to be reasonable or tenable. Fading may arise from the contact of moist hyposulphite of soda — not necessarily in a decomposing or sulphuretting condition — with the metallic silver of a photographic image either upon paper or glass, and that quite independently of the presence of any putrescible organic matter.

What, then, is the destructive element in the moist hyposulphite of soda? Surely it must be the sulphur; and this belief is confirmed by the following experiment, in which the whole process of fading may be exhibited in the course of a few minutes under the eye of the experimentalist:—

Take a plain paper print from the pressure-frame, wash it in order to remove the free nitrate, fix it in fresh hyposulphite of soda, and wash it again thoroughly. Then immerse it in a solution of sulphide of ammonium, containing about one minim of the sulphide to the ounce of water. The print, which is of a brick-red colour, will quickly pass to a brown, then to a violet, and ultimately to a sickly yellow tint. Here, then, we have the whole process of sulphur-toning and fading going on under our very eye in the course of a few minutes, and leaving but little doubt on the mind that the main cause of the fading of silver prints is the persulphuration of the silver in the image.

The only doubtful point, which is still a puzzle to the chemists, is the nature of this yellow sulphide of silver. But here it is not our intention to theorise at present, because that would be foreign to our present subject. What we wish to prove is, that if any pure and fresh hyposulphite of soda be left in a print it will be certain, in the presence of moisture, to cause the print to fade. The amount of yellowness produced will, however, depend upon the relative quantity of silver and sulphur which are brought into contact in any part. If the silver greatly preponderate over the sulphur, as in the deep blacks of the print, these may not be much affected; but in the delicate tints of the lights, where the sulphur preponderates over the silver, the image will turn yellow.

The practical conclusion from what has been said is—that prints should be so treated after fixing as to remove from them the last trace of hyposulphite of soda, no matter whether that be in a sulphuretting condition or not. The most effective way of washing them will evidently be to wash each print separately under a tap, and not to leave them for hours soaking in water which is contaminated with hyposulphite, and sticking together by dozens in a mass. Here we are in accord with Mr. Dunmore, and can fully endorse his advice. Two minutes' separate washing of a print under a tap will do it more good than any amount of soaking in water under such miserable conditions as the above. When prints are thus treated they sometimes begin to fade even in the water in which they are being soaked.

We now come to the important question of how best to remove or destroy the last trace of hyposulphite of soda which may lurk in the paper; and there is, perhaps, no more important problem to solve in photography than this. Silver prints are so beautiful when good, and the means of producing them are so convenient, and so much to the taste of photographers generally, that it is deplorable they should sometimes fade, and that their permanency cannot be absolutely guaranteed. We believe, however, that a method of removing the last trace of hyposulphite of soda, and thereby rendering them permanent, has at length been discovered; and we will now describe this method and discuss the *rationale* of it.

Several years ago, at a time when the fading of silver prints was a subject of even greater anxiety to photographers than it is now, Mr. Sutton, in one of his published articles on the subject, suggested that after a print had been tolerably well washed under a tap, in order to remove the hyposulphite, it should be immersed in a solution of nitrate of lead, and then be washed again. This was not a random suggestion; there was a reason for it, and it seemed to be a good one. If we mix together a solution of nitrate of lead and one of hyposulphite of soda, there is formed a white procipitate, which is hyposulphite of lead. This is very permanent, and if placed in contact with metallic silver in a state of fine division it would not, we imagine, give up its sulphur and be decomposed. Thus the dangerous hyposulphite of soda in the paper would be converted

into the harmless hyposulphite of lead, which, being a white powder, and in very small quantity, would scarcely affect the appearance of the print. Such, at any rate, was the suggestion and the *rationale* of it. It remained for a number of years in the limbo to which many other suggestions have been condemned, until at length it was taken up in America, and has very lately been thoroughly tested and approved. If the reader will refer to page 592 of our last volume, he will see what has been confidently said on this subject in the new world, and that the suggestion has now received the approbation of a committee composed of four distinguished operators.

But it may be objected by some of our readers that what remains in a print after it has been fixed is not pure hyposulphite of soda, but the sweet, double hyposulphite of silver and soda, and that the nitrate of lead may have a very different action upon this. The main force of this objection will, however, vanish if we consider how very small a quantity of chloride of silver there is in a print in proportion to the quantity of hyposulphite of soda in the bath in which it is fixed. A whole sheet of photographic paper only contains a very few grains of chloride of silver, whilst the fixing bath may contain as many ounces of hyposulphite. It follows, therefore, that if the trace of hyposulphite of soda that remains in the paper be but small, the trace of the double hyposulphite of silver and soda which remains in it must be, *a fortiori*, smaller still. Whatever the effect of the lead salt upon this may be, it can hardly, therefore, produce serious mischief, even under the wildest supposition.

Having now done our best to destroy the last trace of hyposulphite of soda in a print, it will remain, of course, to mount it with some safe mountant upon a cardboard which contains no "antichlor," and to keep it always dry. The safest and best mountant is, perhaps, Nelson's neutral gelatine dissolved in alcohol, and containing a little carbolic acid. This has, at least, the merit of not causing the cardboard to cockle. But no print will stand damp. Even common printed matter will become coated with mildew in a damp place. It is not improbable that many sulphur-toned prints which are believed still to contain a trace of free sulphur have been preserved from fading by being kept dry. See the remarks on this subject in an editorial article at page 565 of our last volume. In many chemical operations the presence of water is necessary before two substances can react upon each other. The nice summer beverage, effervescing citrate of magnesia, is a case in point; and so also is common baking powder. Here we have an acid and an alkali remaining in contact in a dry state without affecting each other; and the same thing may, perhaps, occur with the hyposulphite of soda and the silver in a perfectly dry print.

With respect to the presence of albumen in a print, that will, for obvious reasons, diminish its chances of permanency. It seems to us to be very desirable to find some simple means of coagulating the albumen upon a sheet of paper before it is excited upon the nitrate bath, as this might possibly prevent the formation of the substance which has been called "albuminate of silver," and which does not appear to be removed by the fixing bath in the common process of printing.

## SEASONABLE SUGGESTIONS.

We suppose our readers will agree with us in thinking that this holiday season is hardly one suited to serious writing, and that for at least one week processes and manipulations may be laid aside to make room for something more nearly related to a new year's morning. We think there is more than appears on the surface in the usual greeting between friends—"A merry Christmas, and a happy New Year." Christmas is, in our own country at least, the season of mirth and jollity, and we hope our friends have had plenty of both; but they do not always constitute happiness, or are not all that is necessary to promote that enviable state of mind. A "happy New Year" implies a degree of satisfaction with the retrospect of the past, as well as a tolerably clear idea of the necessary steps to be taken for the improvement of the future; and the intensity of the happiness will very much depend on the amount of good accomplished and proposed, or intended to be. The new year, too, is pre-eminently the season of good resolutions—a time when we are more than usually apt to balance our account with the world, and make up our minds that during the year just commenced we shall leave less undone that we ought to have done, than has been the case with us in the year just closed.

In connection with such thoughts there naturally arises the question—Is there anything in the practice of photography, or in those by whom it is practised, wherein it would be advisable to turn over a new leaf? By way of answer, two subjects of much importance readily present themselves—one relating to amateur, the other to professional, photographers.

We think it will be generally admitted that to amateurs we are, at least, largely indebted for the rapid progress that photography has made, and for the high degree of perfection to which it has attained, and, therefore, it is with a feeling of regret that we are obliged to confess that their ranks are getting thinner year by year. Why should this be? It is, no doubt, true that, when the possibility of fixing the camera image first dawned on the public mind, the mere novelty of the wonderful discovery attracted many to its standard, who, wanting sufficient perseverance for its successful practice, soon gave it up for something easier of attainment; but now, when the conditions of success are so well understood, and pretty good results so easily achieved, we should have naturally supposed that its amateur devotees would have increased. For the fact that they have wofully decreased there must be some good reason, and, probably, more than one. One reason, we think, may be found in the great and successful efforts which have been made to bring the practice up to its present position. It is, no doubt, when thoroughly gone into, a somewhat expensive hobby. Our opticians, with laudable zeal, have been constantly striving to improve the instruments on which so much depends, with the result of superseding lens after lens by always something more and more perfect, and the amateur, with little in his pocket to spare, could only *wish* for possession of the more perfect instruments, and, of course, became dissatisfied with what he already had. Then the results of his holiday rambles, just in proportion to their success, were a somewhat heavy drain on his limited means; his friends admired, and, of course, he was delighted to present, till sheet after sheet of paper, with all the accompanying gold and silver, gradually disappeared, leaving, doubtless, much pleasure but no profit behind. This is not as it should be, and in the interest of photography itself we would earnestly urge its abandonment, and recommend, instead, that when the friend of an amateur takes a fancy to one of his pictures he should insist on being allowed to pay at least sufficient to cover the cost of its production. To the amateur we say—Get rid at once of the idea that it is *infra dig.* to make a charge for your productions. Your friends will value them all the more, and apply for them more freely, if such a charge be made; and if you fix it at such a rate as to leave a small margin of profit you may soon be in a position to gratify your desire, not only for a new lens when it is introduced, but for anything else that may aid you in your labour of love.

And now a word or two about our professional brethren. As a class they will compare favourably with any trade or profession in the country; but, nevertheless, there exists in too many cases an amount of professional jealousy and desire to "keep themselves to themselves" that is not conducive to the true interests of our art. This might have been all very well at a time when the art was but little known, and when inconsiderable discoveries were valued as trade secrets, under the impression that they tended to bring more "grist to the mill;" but we think that time long since passed. We believe now that anything that will tend to a more general diffusion of art, chemical, and mechanical knowledge amongst professional photographers throughout the land, will not only raise the standard of work done, but vastly increase the amount required by the public. It is within our own knowledge, that many trades and professions have, during recent years, practically proved the value of mutual co-operation in the rubbing-off of angularities, raising the members, not only in each other's estimation, but also in that of the public, and by increasing the too-frequently unremunerative prices and fees. As a beginning in this desirable direction we would

recommend that some means be devised by which a continuous interchange of the best work done by all the photographers in the country could be made. This might easily be managed, and would be of much value to all concerned. All have something to learn. The best workers might, now and then, be taught what to avoid; while the less perfect would find most valuable hints from the pictures of their more favoured brethren. The work throughout the kingdom would be vastly improved, the public taste be better educated, and true appreciation of first-class work become more general; while, as we have already said, the demand would so increase that, before another new year, the now almost general complaint of dull trade would be a thing of the past.

## SOME NEW LIGHT THROWN UPON THE EARLY HISTORY OF THE WET COLLODION PROCESS.

To the question, Who discovered the wet collodion process? the reply commonly given in England is to the following effect:—"Archer was the first to publish it, and priority of publication entitles a man, in questions of this sort, to be considered the discoverer."

But it is quite possible that a man may rush into print with a process which is not his own, but another man's. If, in such a case, that other man should assert most solemnly, during the last moments of his life and when his last illness was upon him, that he was himself the real discoverer, we are bound to listen to his tale, and, in the cause of historical truth, weigh its probability.

Now this is just what has happened in the case of the wet collodion process. The question of its discovery lies between Archer and Bingham, who both experimented at it together in Archer's dark room. Bingham has asserted that *he* discovered every step of the process from first to last, whilst Archer was a mere looker-on and *aide-de-camp;* that, having done this, the latter published the process in the *Chemist* without his knowledge or consent. This is the tale the probability of which I call on my readers to consider. I made Mr. Bingham's acquaintance in Paris a few months before his death, and when he was already in the jaws of the disease which carried him off; and the substance of the tale which he told me respecting himself and Archer was what I have stated above. I promised him that I would one day make it known, and the proper time for doing so seems now to have arrived. Both he and Archer are in the cold grave, and the question as to which of them was the true discoverer may now be freely discussed, as a matter of history, on such evidence as remains to us. I have thought it right to defer bringing the matter forward until now from obvious motives of delicacy; but death is always busy amongst us, and it must be deferred no longer.

Before going more minutely into the details of Bingham's story, let me recal to the mind of the reader what was the state of the collodion process at a time anterior to that when Archer's name appeared in connection with it. Bingham had already written a work entitled *Photogenic Manipulation*, which was published by Knight, of Foster-lane. In that work he had described some experiments of his own in which collodion was the vehicle for the iodide of silver, and gallic acid the developer; and he intimated his intention to go on with his experiments in this direction. He appears to have allowed the collodion film, containing a soluble iodide, to get dry and hard before he excited it in a nitrate bath. Of course, this plan did not reveal the wonderful powers of the process, and it remained to modify it—first, by exciting the film whilst it was still in a moist state; and, secondly, by developing the image with pyrogallic instead of gallic acid. The question, then, for us to consider is—whether it is probable that Bingham himself put the finishing touches to his own process—as he declared to me that he did—or whether these were put by Archer. The two men were friends, and worked together at the process in the dark room of the latter. We have no other evidence as to which of them put the finishing touches to the process but their own bare assertions; and the question is—Which of these two men's word is to be believed? All we know for certain is that Archer rushed into print with the process, and, in consequence, has carried off all the honour of its discovery.

Being a question of probability, and not of direct evidence, we must compare the characters of the two men and their attainments, and refer, not only to their antecedents, but to their subsequent career. We must consider which of the two possessed the most knowledge of photography, which of them was the better chemist and the better manipulator, and which of them seemed to possess the larger amount of inventive genius and practical sense. All this we shall be able to get at from what is known of their respective careers. The balance of probability, as to which of them was the true discoverer of the wet collodion process, will then turn in favour of him who was the more clever and practical man of the two.

Bingham had already brought the process, by his own unaided exertions, up to an advanced stage, and it required but little to perfect it. His treatise had already proved him to be a clever writer, a man of education, and well versed in the history of photography. He was also well known as a good daguerreotypist and calotypist; and he was a good chemist, having been a public lecturer on chemistry at the London Institution, Finsbury. Subsequently to the discovery of the collodion process, he set up a photographic studio in Paris, and quickly rose to the very top of his profession. No photographer was more celebrated than he as a successful reproducer of modern paintings. During the last year or two of his life he took up with carbon painting, and also purchased the French patent for the Woodbury process; but being to ill for experimenting he sold the latter to MM. Goupil. From first to last his career in connection with photography was a brilliant one. As a photographic writer, artist, and chemist, he stood in the very first rank. We never heard of his making unwise, random experiments, taking out foolish patents, muddling away his money, and living in the midst of dirt, debt, and destitution. He was one of those sagacious, practical men who succeed. Now all this being matter of history about which no doubt exists, is it not likely that such a man would, when experimenting with his own collodion process, so vary it as to excite the film whilst still moist instead of allowing it to get dry, and, from his knowledge of chemistry, substitute pyrogallic for gallic acid in the developer? Was there anything beyond the reach of his attainments or the sketch of his genius in doing this? He solemnly assured me that he *did* do it. Are we, then, to believe his word, or not?

On the other hand, what were the attainments, the antecedents, and the subsequent career of Archer? Were these such as to induce us to believe that *he* was the more likely man of the two to have perfected Bingham's process?

I regret that I cannot answer these questions so fully as I would wish. I did not know Archer personally, never visited him in his *sanctum*, never saw any of his productions, and never worked in his patent dark box. But what I have heard about him does not give me an exalted idea either of his scientific attainments or his practical sense. When he was left to run alone in experimenting he seems to have dabbled in optics in a foolish way which led to nothing, and to have lived in a general muddle, in the midst of which he died, leaving his family destitute. On the whole, therefore, when comparing the two men's characters and career, so far as I know of them, I prefer to take the word of Bingham than that of Archer respecting the discovery of the final steps in Bingham's collodion process.

But now comes the question—Why did Bingham, if he were the real discoverer, not protest at once against Archer's claim to be so. and publicly state his own case? This I put to him, and his reply was that he did not at first consider the collodion process of so much practical value as to make it worth his while to kick up a row about it. Although it had its charms it seemed to be full of caprices, and he did not at first suppose that it was likely to have any great commercial value. It did not, therefore, seem worth his while to put himself in a passion with his friend for what he had done in publishing it without his consent. Afterwards, when the process began to assume more importance, it was too late. Nevertheless, he he had frequently told personal friends the same story which he told me. There may be some truth in all this; for, in the first place, we can easily imagine how coquettish the new process must have been in its earliest infancy from our own experience of it in its youth; and, in the second place, we know how very averse some men are to engaging in an angry public discussion, particularly with an old friend. Besides which, Bingham would have no direct evidence to advance in support of his claim, and nothing but a belief in his own bare assertion to trust to. If this were not accepted he would be involved in ridicule. So, on the whole, perhaps his silence was a proof of wisdom.

I now leave the matter with the reader. I have fulfilled my promise to the dead, and have stated frankly my own impressions with respect to the truth of the story which was told me. I have no interest in supporting the tardy claim of Bingham to the discovery of the wet collodion process, for he was not an intimate personal friend of mine, as I have only met him once—that is to say, on the occasion referred to. But in the cause of historical truth the probability of his statement should be weighed impartially.

Amongst those who read these lines there will probably be some who can throw more light upon the subject, and, if so, I conjure them to do so. If it can be shown that Bingham's claim is an entire

myth, and his statements devoid of truth, then let the future historian of our art accord to Archer the full credit which may be his due. Otherwise, let the two men at least be bracketted as joint discoverers; for we must not ignore the fact that Archer was the first to publish the process.

I would observe that the question—Who first used collodion in photography? is not that which we are now discussing. That is one which seems to lie between Bingham and Le Gray.

THOMAS SUTTON, B.A.

## NOTES ON PASSING EVENTS.

BY A PERIPATETIC PHOTOGRAPHER.

AT the commencement of another year I greet, with all the heartiness at my command, those who do me the honour of reading my erratic *Notes*. Some of those whom I thus greeted last year are now, alas! no more. Some day the same will be said of each one of us. "Mortality" is stamped on all.

On what head are we to place such a crown of honour as shall be deemed worthy of award to him who was the first to take life-size portraits direct? Rival claims have, I observe, been made on behalf of Mr. Crawshay and of Colonel Stuart Wortley—in the former case the claim having been made by the editor of one of your contemporaries, and in the latter by Colonel Wortley himself. It has been presumed, and now seems to be admitted, that, of the two, this proud pre-eminence belongs to the gentleman last named, he having exhibited life-size heads taken direct so long ago as 1870—over four years since. Alas! that such a pleasant aërial castle should have to be demolished! How, or in what words of condolence, may I venture to inform these rival claimants for a doubtful honour that both have been forestalled "long, long ago." I will humbly add my mite to this great historical event by giving what may be considered the unpalatable information that in the Great International Exhibition of 1862 were exhibited *several* life-size heads, taken direct. They were to be found in the French, Belgian, and other departments, as must be acknowledged on reference to the Official Catalogue, which contains definite statements relative to the fact of their being "life-size portraits, taken direct." I imagine that some American photographers, too, could say a few significant words relative to the modern claims referred to. The form of lens used by the continental artists in the production of these large portraits was similar to, though differing in focus from, that employed by Mr. Chaffin in taking his prize picture.

It is gratifying to observe that the efforts made to photograph the transit of Venus have proved successful.

A suggestion has been made by Mr. William Brooks to the effect that it is desirable that photographic societies should effect an interchange of *carte* portraits of the members of each society. Such a scheme could be very easily and very cheaply carried out, and would prove an interesting collection. But an album to contain portraits of all who have rendered aid in the development of our art-science would, of necessity, be of mammoth and unwieldy proportions; for the number of this class is, fortunately, so great that no album hitherto manufactured would contain half the number of claimants for so honourable a resting-place. Still, the attempt might be made; and a fitting society to initiate such an attempt would be that at which the suggestion was made, viz., the South London Photographic Society. If left to the Parent Society it would, I fear, never be done, and no other society exists in London than that at which the proposition originated. Committees are often appointed to carry into effect less important matters; therefore, let a committee be appointed to carry out this proposal practically.

Speaking of the South London Photographic Society I am reminded that this Society has brought honour to itself by doing honour to its President, as was the case a fortnight ago, when that respected gentleman was presented with his portrait painted in oil. Those who are competent to speak on the subject aver unanimously that the President forms the cementing bond between its members, preventing that body from falling to pieces. I have heard some photographers speak of the desirableness of forming a third society possessing certain features different from those already existing. It is not a long period since a society, called the Dry-Plate Club, was formed in London. Can anyone enlighten me as to what became of that body? Is it dead or alive, or merely dormant? Going up like a rocket, it appears to have come down like the stick. And yet an association of dry-plate workers *ought* to thrive in the metropolis, in which there are so many who practice and feel interested in dry processes. The Field Club, I rather suspect, has cut the ground from under the feet of its "dry" brother.

It is said—and correctly so, I understand—that Colonel Stuart Wortley has sold his business, and retired from commercial photography—to the extent, at any rate, of ceasing to prepare dry plates for sale. I do not imagine, however, that the appointment he holds in the Patent Museum will interfere with his printing and disposing of proofs from his negatives, as heretofore, to such as desire to possess them. The genial influences of an old-fashioned Christmas have rendered me unusually pacific at the present moment, or else I might have prepared a dish and set it out for the non-coalescing expression of photographic opinion, by asking—What constitutes a professional photographer? Can a line of demarcation be drawn between a professional and a non-professional photographer, who, very wisely, endeavours to recoup himself, as far as he can, for his expenditure of money, time, and skill in riding his hobby? Where, in short, is the hard and fast line to be drawn between a professional and an amateur photographer? Very much, indeed, might be said upon this subject; but, for the reason at which I have above hinted, I abstain from a personal "deliverance" on this otherwise interesting theme.

"Now's the day and now's the hour" for securing snow and ice effects, including "real" skaters. Views may be taken from nature while robed in its glacial mantle, and figures (presumed to be gyrating) on skates, wrapped in furs, mufflers, and other seasonable aids to enjoyment and comfort, may be photographed in the studio as living and moving adjuncts to an appropriate landscape. Thanks to the head and body rests for which Leeds has acquired such a good reputation, a figure can be posed in any of the positions usually assumed by skaters. Considering how very uncertain is the duration of weather suited for this purpose, I quote the old Latin aphorism and say "*carpe diem*," which, when *very* literally translated, may be rendered—Out with your cameras while the weather is "frosty but kindly" in this rare old wintry season.

## ON THE USE OF PHOTOGRAPHIC AND CHEMICAL APPARATUS.

### CHAP. VIII.—TAKING SPECIFIC GRAVITY.

THE specific gravity of a substance is the expression of the proportion existing between its weight and that of some other body used as a standard, equal volumes of each, at the same temperature, being compared. In the case of liquids and solids pure distilled water is used as the standard with which all are compared; and for gases, atmospheric air. For some scientific investigations hydrogen gas is taken as the standard for gases, the specific gravity being taken in air and reduced by calculation to the proper proportion for the hydrogen.

As an example, we may take an ounce bottle or a measure. It will hold about an ounce of water, three-quarters of an ounce of ether, an ounce and a-half of nitric acid, four-fifths of an ounce of strong alcohol, and so on. Water is the standard, and is called "1," or sometimes "1,000," specific gravity—generally written "S.G."—ether being ·75, nitric acid 1·45, strong alcohol ·820, these decimal fractions bearing the same proportion to 1 that the weight of the equal volumes—that is, the respective bottlefuls—bear to water.

The subject is one of very great importance, the specific gravity of many substances being a guide to their composition; while theoretical chemistry may be said to be intimately bound up with it, and for practical chemistry it is in daily request. The photographer who wishes to try the strength of his ether, his alcohol, or the acids he makes his pyroxyline with, or the strength of his silver bath by the argentometer, in all cases makes use of specific gravity.

It will be evident that, in the case of solids—which may be presented in the state of powder or in large pieces, soluble or insoluble in water—the obtaining of them in a form in which their bulk could be directly measured would be, in most cases, quite impossible. This, however, causes no difficulty, as the most perfect measurement can be obtained indirectly; for, whatever the shape of a particle of matter, it is known that, when immersed in water (not being soluble), it displaces a volume exactly equal to its own, and, when weighed while in the water, its weight is reduced by just the weight of its own volume of water. We thus have all the data needed—The body is weighed in air—that gives the absolute weight; its weight in water is subtracted, the result gives the weight of an equal volume of water; the quotient from the latter as a divisor, and the former as a dividend, is the specific gravity. For example: a piece of gold weighing 240 grains in air weighed in water loses $12\frac{1}{2}$ grains; therefore, $\frac{240}{12 \cdot 5}$ gives 19·2—the specific gravity of gold.

The operation is performed by weighing as large a piece as convenient of the gold or other substance in the ordinary manner with the utmost accuracy, the balance being provided with a pan having short suspensions, and then suspending it with the slightest possible thread or filament of silk from a small hook under the short pan, and allowing it to become wholly immersed in a little beaker of water placed directly beneath, carefully detaching any air-bubbles that may form and adhere. The weights required to be put in the short pan to counterpoise and counteract the tendency to rise caused by the immersion in water will be the weight of an equal volume of water. If the substance be in powder or small grains the most ready method will be, after weighing the bulk, to drop it into a small bottle with a very narrow neck completely filled with water; the water will of course overflow, and in quantity be just equal to the volume of the powder. The weight of that volume will be found by subtracting the weight of the carefully-wiped bottle containing water and powder from the sum of the combined weight of the powder and the bottle full of water only.

If the material to be operated upon be soluble in water it should be varnished first, or, if that be inapplicable, it must be weighed first in air and then in some liquid in which it is insoluble. The difference in weight then gives, of course, the weight of an equal volume of the liquid, and this weight, divided by the specific gravity of the liquid (as ascertained beforehand), gives the weight of the volume of water equal to that of the material used.

One other variation is to be noted, namely, a substance *lighter* than water. The weight of an equal volume of water is found by adding to the weight of the substance a quantity equal to the difference in weight between a piece of lead heavy enough to sink it, weighed (in water) first by itself, and then attached to the light substance.

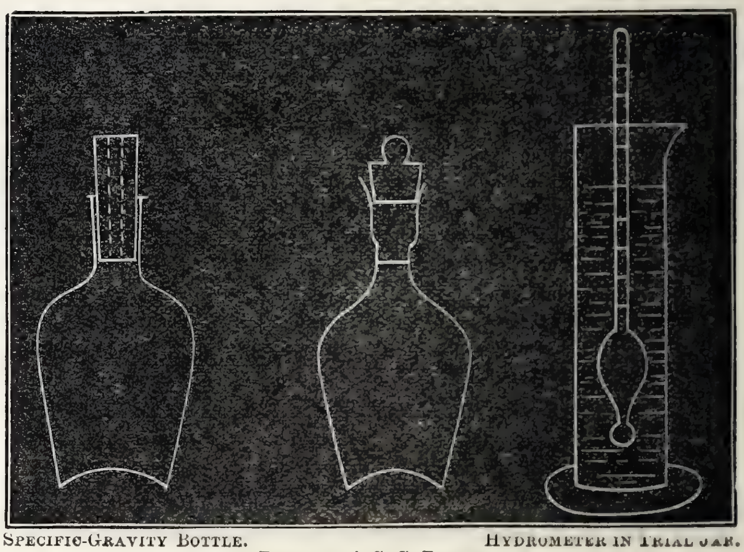
The operation of taking the specific gravity of solids, however, will be of comparatively rare occurrence, while that of fluids will be in constant request. The obtaining exact measurements of volumes of fluids is perfectly easy, and for estimating accurate specific gravities the plan is adopted; but for less exact purposes it is taken by means of an hydrometer—an instrument presently to be described—which sinks to a greater or less depth in fluids according to their density.

In the first process a bottle is procured, and the weight of its contents in distilled water at the standard temperature determined with the utmost precision possible, as it is to serve as a standard in all future experiments, and an error once made would be continued through the whole range of every estimation made by its aid. This weight is to be marked on the bottle, and also the exact weight of the bottle itself to avoid the necessity of future weighings. If this bottle be filled with the fluid to be tested, and from the gross weight of the whole that of the bottle be subtracted, the result will be the weight of the contained fluid. Dividing this result by the weight of an equal volume of water (that is, the bottleful whose weight is already known) we get the specific gravity.

In this, and in all specific-gravity estimations of fluids, the temperature has strictly to be attended to, a difference of more than a degree or two either way causing material deviations in the results. Water, which expands by heat less than any fluid, gives a difference in specific gravity of ·012 between the temperature of 32° and 212° Fahr. It may be well here to suggest to the student to bear in mind that many fluids when mixed together, and almost all solids when dissolved, become changed in temperature—liquids whose original temperature are known to be right giving thus entirely misleading results if the change be not noted.

When very small quantities only can be operated upon small bottles holding from one to five hundred grains are used; but when any considerable quantity is available a bottle in widespread use which contains 1,000 grains of water is substituted. All calculation is thus avoided; the weight of the bottleful of whatever liquid is tried at once gives the specific gravity without calculation, water being called "1,000," or, by putting the decimal point three places to the left, "1." These bottles, called "specific-gravity bottles," can be obtained ready made from all dealers in chemical apparatus. They are generally sold enclosed in a tin case, with a lid containing on its top another box holding a brass weight which exactly counterpoises the bottle. The most common shape is represented in *fig.* 4. It has a stopper, which is drilled through with a small hole to allow any excess of fluid to escape, which, when the weight is taken, should be most carefully wiped off the outside. In another form the neck is marked with a file to show the exact height of 1,000 grains of water, and for this description a plain stopper is used. Sometimes a double file mark is made, to show the upper and lower lines of the concave surface of the fluid. This shape is to be recommended, the former one being objectionable on account of the exudation from the stopper upon the slightest rise in temperature, which, when considerable, causes the liquid to run on to the balance pan, materially injuring it when of a corrosive nature, and rendering repeated wipings necessary to obtain the correct weight. The perforated stopper is also to be objected to on account of the facilities it offers for evaporation and consequent falsifying of the results. To guard against loss by evaporation, or the inconvenience of the fluid overflowing, Regnault has devised an alteration in the shape of an enlargement of the upper part of the neck. The bottle is filled with the fluid to be examined up to the mark in the narrow part of the neck, care being taken that its temperature is correct at the time, and the stopper put in. The loss by evaporation is prevented by the stopper; and upon any increase in the temperature, and consequent expansion in volume, the enlargement in the neck receives the portion that would have otherwise overflowed.

FIG. 4. FIG. 5. FIG. 6.



Specific-Gravity Bottle. Hydrometer in Trial Jar.
Regnault's S. G. Bottle.

It should be scarcely necessary to point out that the specific gravity bottle is to be perfectly clean and dry, *inside* as well as out, before receiving the fluid to be weighed; and, also, that when the operation is concluded it is put carefully away clean and dry, one of the methods of drying bottles alluded to in the first chapter being adopted. When, however, several determinations of gravity have to be taken in rapid succession it will be sufficient between each filling to rinse the bottle well out with distilled water, followed by several successive small quantities of the liquid next to be weighed. The last portion being emptied out the bottle will be in a fit state to be filled up. If, however, the liquid be one that is not miscible with water it must be washed out with some intermediary agent, so as to leave the bottle fit to receive water, or the liquids introduced in such succession that the same end will be attained. For instance: the specific gravities of oil, turpentine, ether, alcohol, and an aqueous solution are required; if used in the order they are put down small quantities of each fluid may be used to get rid of the traces of its predecessor, and much time thus saved.

For determination of relative density, where great accuracy is not required, use is made of hydrometers, one form of which—the argentometer—is well known to photographers. These are globular or pear-shaped bulbs of glass, with long tubes or stems attached, and are weighted with a little mercury or some small shot inside, which, falling to the bottom of the bulb, keeps the whole upright when immersed in any liquid. In the tube is fixed a paper or ivory scale, upon which is marked a scale of gravities. To use this instrument a tall cylindrical glass jar is partly filled with the liquid to be tried at the standard temperature and the hydrometer placed in it, when as the density of the fluid is high or low the stem will stand high or low above its surface; the number on the scale opposite the surface gives the specific gravity. It will be noticed that the fluid rises round the stem for a slight distance, forming, as in measures, a second line. The general level of the fluid is usually read from, though, when the utmost correctness is needed, it will always be well to test the instrument beforehand before reading off the specific gravity to observe which line has been used in making graduations. The hydrometer, after becoming stationary, should be pressed down into the fluid for about an inch, and then again allowed to come to rest. This, by wetting the stem, gives it free play, and overcomes

the resistance the glass offers to the fluid, which occurs to an extent that will sometimes cause the same instrument to give indications two or three degrees higher or lower than the correct one. The glass stem should be kept clear and free from grease.

This instrument is of very great use to manufacturers, being in constant request during the process of evaporation, crystallisation, and extraction. In addition to showing the specific gravity by mere inspection it is made with a great variety of scales, each peculiar to the special purpose it is in most request for; just as in the dark room it takes the form of the argentometer, the brewer uses a saccharometer, and the tanner a barktrometer. Then there are salinometers, acidometers, urinometers, &c., &c., in which the scale is either entirely arbitrary or made to indicate directly the grains per ounce or pounds per gallon, &c., of the substance dissolved, as indicated in the name.

For general use it is sufficient to have two spindles—one for liquids lighter, and the other for liquids heavier, than water; but when greater delicacy is required a number of spindles are kept, each having but a very limited range (governed by the thinness of the stem) and a consequent increased nicety in the reading, as a small difference in the density then causes a considerable difference in the depth of immersion.

The argentometer shows by inspection the grains of nitrate of silver contained in each ounce of solution. It is only of use for the printing bath, and its indications are not to be too much relied upon for that. One only is made use of.

Hydrometers showing the specific gravity directly on the scale are made, in which one spindle shows all degrees between ·7 and 1·9, giving rough indications of all liquids ranging between alcohol and sulphuric acid; while, for some purposes, as many as seven different spindles are made to give the same range with a corresponding increase in accuracy, a difference of one or two degrees being shown by them. In testing the accuracy of direct specific-gravity hydrometers the highest and lowest, and some of the intermediary degrees also, should be tested, the difference of equal number of degrees of specific gravity not being shown by equal division on the stem.

One other form needs here to be treated of—that is, the Twaddell's hydrometer, sold by all dealers in chemical apparatus, which is in general use throughout the country among manufacturers and others. It is very useful to the photographer for solutions in common request, such as hypo., iron, &c. Solutions of two or three different strengths of these salts are made and the hydrometer immersed, a memoranda being made of the figure on the index corresponding with each particular strength. For future use a solution of any strength being made by guesswork of the hydrometer at once tells its strength, by a moment's immersion, and indicates the amount of water to be added to bring it to the required strength. These hydrometers are made in sets of six, and are for liquids heavier than water, the scales ranging from 0 to 170. Each degree on these hydrometers is equal to ·005 specific gravity, so that any indications can be easily converted into specific gravity by multiplying it by ·005 and adding the result to 1, thus—15° Twaddell = 15 × ·005 + 1 = 1·075 specific gravity. G. Watmough Webster, F.C.S.

## FOREIGN NOTES AND NEWS.

Yellow Spots on Prints.—Colle Ramié.—M. Van Tenac's New Oil Lamp.—M. Davanne's Waxed-Paper Process.

French photographers seem to be in great trouble just now about yellow spots on their prints. The evil is becoming worse and worse, and more and more general. It has, in fact, assumed the character of an epidemic, and has received the title of the "small-pox of photography." Many suggestions have been made as to its cause, but none of them seem to meet the case or clear up the difficulty. Certain localities seem to be more favourable to the development of these spots than others, and there are still persons who believe them to proceed from noxious germs in the atmosphere which settles upon prints and grow, feeding as it were upon the silver, and converting it into a yellow substance. But why should germs exist only in the atmosphere? Why should they not exist in the possibly impure water with which prints are washed? We know that the germs of cholera are frequently conveyed by water; why not then the germs which produce yellow spots in prints? Be that as it may, this trouble is occasioning a serious pecuniary loss to photographers, for how can they send out portraits which have a yellow spot on the tip of the nose, in the eye, or upon the cheek of beauty—or even of ugliness? There are even persons so fastidious that a yellow spot upon the dress or the background will cause their rejection of a print. The evil is, therefore, a grave one, and the true cause of these spots an important problem for experimentalists. At the last meeting of the Photographic Society of France, whilst the reflectoscope was being exhibited by M. Van Tenac, M. Davanne employed it for the exhibition, on an enlarged scale, of one of these spots, which appeared in general to consist of a multitude of light dots upon a dark ground. The exhibition was watched by the members with the greatest interest, but nothing new was elicited on that occasion; the cause of the spots is still a mystery, which careful experiment and observation can alone clear up.

This reminds us that an oil lamp of peculiar construction, supplied with oxygen, or even with common air, and which is the invention of M. Van Tenac, is found to give sufficient light for the use of his reflectoscope, not merely when enlargements are exhibited upon a screen, but even when photographs are taken of them. Instead of a jet of hydrogen a peculiar kind of burner is used, with a common wick, into which the oil is forced, as in the moderator lamp, by a piston and a spring. This burner is composed of several cylindrical and concentric tubes, which allow the currents of air or of oxygen to reach the flame they supply. To these one, two, or three concentric wicks can be adapted and used together according to the required intensity of the flame. The currents of air or oxygen are quite isolated from each other, so as only to meet the flame at the point of combustion. The jets of oxygen can be regulated at will, and the burner is so contrived that the surplus oil falls back into the reservoir without entering any of the gas tubes. The wicks might be made of asbestos, but this would be expensive. A good plan might be to steep them in some chemical compound which would render them incombustible, after which they might be dried.

To return for a moment to the subject of the yellow spots. M. Lacan expresses his belief that they may be due to the mounting solution employed, and takes the opportunity of recommending the use of the "colle ramié" as a remedy. He states that this does not decompose by keeping, and that he has had a pot of it in use for several weeks, which, although it has only been carelessly covered with a torn piece of paper, is still as good as ever. Unfortunately for this theory of the cause of the spots they come upon *un*mounted prints, as we happen to know to our sorrow.

Those who are still interested in the waxed-paper process will be glad to hear what M. Davanne has been saying about it lately in one of his lectures. He recommends either Rive or Saxe paper. The sheet is to be waxed by putting it into a dish of wax, which is kept melting over boiling water. It is then to be ironed, with a hot iron, between two sheets of blotting-paper, which absorb the excess of wax. This done it has a matt and translucent appearance. It is next to be immersed for half-an-hour in the following iodising solution:—

| | |
|---|---|
| Skimmed milk, clarified | 500 c.c. |
| Iodide of potassium | 7½ grammes. |
| Bromide of potassium | 2 ,, |
| Sugar of milk | 10 ,, |

The skimmed milk may be replaced by rice water. The sheets are then to be hung up to dry, and when dry may be kept in a portfolio until required for use. They are made sensitive by immersion for three minutes in a bath of aceto-nitrate of silver, and are then thoroughly washed in order to remove the free nitrate. The exposure is about double of that required for ordinary dry collodion plates. The development is effected by a saturated solution of gallic acid, to which a few drops of aceto-nitrate are added.

The negative is fixed in a strong bath of hyposulphite of soda, and is then well washed and dried. In this state it has a very granular appearance, and the finer details are lost; but it may be much improved by holding it before the fire and remelting the wax. The process, we are told, leaves much to desire, and its results are not comparable with those upon glass; but the negatives have the advantage of portability, and do not incur the risk of being broken. It should be remembered, however, that the sensitive papers will not keep more than a few hours—at least, so says M. Davanne—so that they must be prepared and developed *en route*. They may also be ruined by being creased. A really good paper process would be useful for large subjects taken direct, which would probably be finer than enlargements from small negatives. It is a great merit of paper negatives that they may be printed either reversed or non-reversed, so as to suit any style of printing, as well as the reflecting stereoscope and the panoramic camera.

At the Flemish Gallery, in King-street, may now be seen some of the finest pictures which were exhibited at the Paris Salon this year,

We feel sure that our readers will be glad to hear that a member of the photographic brotherhood—the son of Mr. Sutton—has just received a medal and diploma from the French Government for having saved the life of a book-keeper, last summer, on the canal between Nantes and Brest.

## Contemporary Press.

### LIEBERT'S METHOD OF PRODUCING TRANSPARENCIES.

[PHILADELPHIA PHOTOGRAPHER.]

PLACE in a dish the whites of four fresh eggs, which will give about 100 grammes ($3\frac{1}{5}$ ounces troy) of albumen; then add 75 grammes ($2\frac{2}{5}$ ounces troy) of distilled water, in which have first been dissolved—

| | | |
|---|---|---|
| Iodide of ammonium | ............ | 4 grammes ($61\frac{3}{4}$ grains). |
| Bromide ,, | ............ | $1\frac{1}{2}$ gramme (23 grains). |

Beat them to a froth, and allow them to stand twenty-four hours; then filter, and you will have an iodised solution of albumen.

Take a plate that is thin, very pure and flat, of the size of the small negative that you wish to produce, or of a four-fold dimension, which is to be divided by a diamond, after the preparation. When it is well cleaned coat it with a film of neutral albumen diluted with three times its volume of water, in order to make sure of its being perfectly clean. When this film is perfectly dry collodionise as usual with a good iodised collodion. When the film has set, which requires from five to six minutes, wash under the tap in filtered water, until the collodion no longer shows greasy marks. Finish by washing in distilled water, drain for a short time, then cover with five or six successive coatings of the iodised solution of albumen described above. Dry in a place free from dust, placing the plate on blotters against the wall. The plates thus prepared may be preserved indefinitely in grooved boxes. It is better to prepare a quantity at a time, so as not to be obliged to recommence each day this long and delicate operation.

When you wish to make a positive by transparency, dip this plate, *perfectly dry* (using, if necessary, an alcohol lamp), into a new bath of aceto-nitrate of silver, thus composed :—

| | | |
|---|---|---|
| Nitrate of silver ............ | 80 grammes | ($2\frac{1}{2}$ troy ounces). |
| Crystallisable acetic acid.. | 50 c.c. | ($1\frac{3}{4}$ fluid ounces). |
| Distilled water............... | 1 litre | ($1\frac{1}{20}$ quart). |

After an immersion of one or two minutes wash again in distilled water and dry with care, but this time away from the light. When the desiccation is complete place this plate under the negative in a pressure-frame, and now expose to diffused light; an exposure of from five to fifteen seconds is generally sufficient, according to the intensity of the negative and of the light. Then carry to the laboratory to develope as follows:—On leaving the frame the plate is placed in a dish filled with distilled water to moisten the coating of albumen; it is then covered with the developer, composed of—

| | | |
|---|---|---|
| Distilled water .............. | 1 litre | ($1\frac{1}{20}$ quart). |
| Pyrogallic acid ............... | 7 grammes | (108 grains). |
| Acetic acid ..................... | 30 c.c. | (1 fluid ounce). |

Under the action of this reagent the image presents a weak appearance; now add a few drops of the following intensifying solution:—

| | | |
|---|---|---|
| Distilled water .................... | 1 litre | ($1\frac{1}{20}$ quart), |
| Nitrate of silver .................. | 20 grammes | ($308\frac{1}{2}$ grains), |
| Citric acid.......................... | 5 ,, | (77 ,, |

and continue the development until the image has arrived at the requisite degree of intensity. The action of the developer is stopped by a good washing, and the fixing is done by means of hyposulphite of soda or cyanide of potassium very much diluted.

If during the development the image should be mottled rub the surface lightly with a tuft of cotton-wool. Under this friction, repeated several times, the image will become perfectly transparent.

Finally, after the washing that follows the fixing, plunge the plate into a bath composed of—

| | | |
|---|---|---|
| Distilled water ......................... | 2 litres | ($2\frac{1}{10}$ quarts), |
| Chloride of gold ...................... | 1 gramme | ($15\frac{1}{2}$ grains), |

in which the image will acquire a sepia tone, suitable for the gradual transmission of the light passing through the positive to produce a large negative strong in the blacks.

It might be advisable, according as the little negative to be reproduced is more or less hard, to modify the colour of the positive by transparency, by covering it, *before* the gold bath, with a coating of bichloride of mercury much diluted. This positive by transparency thus finished is dried; then, should it be too grey or hard, place it in contact with a very thin ground glass, the two polished sides of the glass being in contact, so that the ground side should be on the outside as well as the image. Surround with a gummed paper, retouch if necessary on the ground side of the glass, which requires a few minutes, then proceed to obtain the large negative as will be explained further on.

SECOND METHOD.—The second method consists in operating on the collodio-chloride of silver as is described further on.

Prepare separately the following solutions:—

A.

| | | |
|---|---|---|
| Sulphuric ether .......... | 200 c.c. | ($6\frac{3}{4}$ fluid ounces). |
| Alcohol........................ | 100 ,, | ($3\frac{3}{8}$ ,, |
| Gun-cotton .................. | 5 grammes | (77 grains). |

After resting a few days decant the clear portion.

B.

| | | |
|---|---|---|
| Alcohol........................ | 25 c.c. | ($\frac{7}{8}$ fluid ounce). |
| Chloride of magnesium... | 0·75 gramme | (12 grains). |

The chloride of magnesium is finely pulverised in a glass mortar to facilitate the solution, which is to be then filtered.

C.

| | | |
|---|---|---|
| Alcohol........................ | 20 c.c. | ($\frac{2}{3}$ fluid ounce). |
| Nitrate of silver........... | 4 grammes | ($61\frac{3}{4}$ grains). |
| Distilled water ........... | 10 c.c. | ($\frac{1}{3}$ fluid ounce). |

The nitrate of silver is pulverised, and then dissolved in the distilled water; add the alcohol and filter.

D.

| | | |
|---|---|---|
| Alcohol........................ | 18 c.c. | ($\frac{5}{8}$ fluid ounce). |
| Citric acid ................... | 0.50 gramme | ($7\frac{3}{4}$ grains). |
| Boiling water ............... | $2\frac{1}{2}$ c.c. | ($\frac{2}{3}$ fluid drachm). |

Dissolve the citric acid in the boiling water, add the alcohol, and filter.

To prepare the collodion pour the solution B into the solution A; agitate strongly, then add the solution C. Cork the bottle and shake for a few minutes; then add the solution of citric acid D. Agitate again, and allow to rest for eight or ten days. This collodion, thus prepared, improves with age; but it must be kept away from the light in a yellow glass bottle.

Now prepare a solution of albumen in three times its volume of distilled water, and filter through a fine sponge.

The plates, well cleaned, are coated with albumen, which makes certain their absolute *cleanness*. When entirely dry flow the collodio-chloride very slowly on the albumenised side, so as to obtain as thick a coating as possible. Allow them to dry *spontaneously* where there is no light or dust; then place them in grooved boxes perfectly clean.

Thus prepared the plates may be preserved for several months, if kept in complete obscurity.

Before exposing the plate under the negative it should be treated with the vapours of ammonia so as to avoid solarisation. Use for that purpose a glass box, the grooves of which are placed horizontally. Place at the bottom a small capsule containing fifteen or twenty grammes (231 or 308 grains) of pulverised carbonate of ammonia. The plate is slipped into one of the grooves, at eight or ten centimetres (three to four inches) above it, and exposed for four or five minutes to these vapours, then left to the air for ten or fifteen minutes more, protected from the light. It is now dried with care over an alcohol lamp, and then placed in the pressure-frame in contact with the negative to be copied. Cover with a sheet of black paper, close the frame, and expose to full light.

The print should be very strong, for it will lose a great deal in the toning and fixing baths. The time of exposure is rather longer than for albumenised paper; but it is easy to follow the progress of the printing without being obliged to separate the two plates, since the transparency of the glass allows the image to be seen from the back by raising the paper cushion which is under the hinged *planchet* of the frame.

The image, printed to the proper strength, is washed in ordinary water and placed in a flat dish containing a toning bath, as follows:—

A.

| | | |
|---|---|---|
| Distilled water ..................... | 1 litre | ($1\frac{1}{20}$ quart). |
| Sulphocyanide of ammonium... | 40 grammes | (617 grains). |
| Hyposulphite of sodium ........ | 3 ,, | (46 ,, ). |

B.

| | | |
|---|---|---|
| Distilled water ..................... | 1 litre | ($1\frac{1}{20}$ quart). |
| Chloride of gold, neutral ...... | 1 gramme | ($15\frac{1}{2}$ grains). |

Before making use of them mix the two solutions in equal portions, and in sufficient quantity to cover the plate, which is placed at the bottom of the dish.

To obtain strong negatives the toning should incline to red rather than to violet. This is easily obtained by using a little more of the solution A than of the solution B; besides, the tone of the print may be varied at will by giving more or less time to the action of the toning bath, which is very important for this kind of work, for we know that, light passing more easily through the violet positive than through the one with a brown tint, the large negative which results from a sepia-red transparency will be stronger than one obtained from a violet positive. Consequently by this means we may obtain a very soft, large negative from a small, hard positive, and *vice versâ*.

When the print has obtained the desired tone fix by plunging it for five or six minutes into a dish containing a solution of hyposulphite of soda at eight per cent.

The positives obtained by this process are of admirable delicacy and transparency, consequently the large *clichés* produced by them have all the qualities of the small negatives used in their reproduction. On account of the facility with which it may be worked we prefer it to the

albumen process, whose manipulation is much more delicate, and whose results are less certain on account of the time of posing, which can only be estimated. Nevertheless, in the dark days of winter, the albumen process being more rapid, we can obtain by it very good positives when the collodio-chloride process is often incapable of giving us a strong image.

M. LIEBERT.

# Meetings of Societies.

## PHOTOGRAPHIC SECTION OF THE AMERICAN INSTITUTE.

AT the October meeting of this Society Mr. H. J. Newton occupied the chair.

Mr. J. B. GARDNER presented a report on the removal of hyposulphite of soda from prints. [See page 592.]

Mr. NEWTON said that one important point, in his estimation, was left out of the report. Most water contained sufficient carbon to form carbonate of lead when a solution of nitrate or acetate of lead was added to it. The water became cloudy, and in that condition it would precipitate upon the surface of the print. There should always be sufficient acetic acid added to dissolve that carbonate of lead, and then the water would become perfectly clear.

Mr. DUCHOCHOIS had used Mr. Newton's process for porcelain plates, and found that the pictures were permanent for ten months, while similar prints not treated by lead had faded. He believed that the injury did not arise from the hyposulphite itself. The hyposulphite alone would not make a print fade. It was the hyposulphite of silver formed in the fixing solution that was injurious. Mr. Newton's process was perfectly sure to eliminate the hyposulphite.

The report of the committee was accepted.

Mr. HENRY T. ANTHONY said that it was not necessary to confine themselves to the acetate of lead. The salts of lime, which combine easily with sulphur, might be used, and the salts of baryta. They tried experiments with baryta which were equally successful with the lead.

Mr. O. G. MASON found, during the experiments of the committee, that very little water was needed for washing the prints. One gallon of water was placed in a dish, and the prints dipped in directly from the lead solution, and in that water not a trace of the hyposulphite of soda could be found. If a photographer had to carry water up four or five flights of stairs, that was an important item.

The PRESIDENT said it would require, of course, time to determine the permanency of the prints. It was three years ago last August that he first published the formula. He had prints three or four years old washed in this way, and they had undergone no change yet. He had had them sent to him from different parts of the country and from Bermuda and the West India Islands, where they had been exposed to the sun for many months and had not changed.

Mr. Anthony exhibited a new vignetting-frame, constructed so as to admit of varying the distance of the opening from the picture, and also to change the shape of the vignette.

Mr. ABRAHAM BOGARDUS considered that two-thirds of the vignettes were made with the opening too close to the picture.

Mr. ANTHONY introduced Mr. H. Hammenstede, who exhibited pictures made by his new emulsion process.

The PRESIDENT exhibited negatives which he had made by the same process, and prints from the negatives.

Mr. BOGARDUS moved the appointment of a committee of five to investigate the matter and determine its practicability, and whether the process could be advantageously substituted for the ordinary process in gallery work.

The motion was agreed to.

Mr. ANTHONY regarded the negatives as excelling in aërial perspective.

The PRESIDENT appointed as the committee Mr. Abraham Bogardus, Mr. Henry T. Anthony, Mr. James Chisholm, Mr. O. G. Mason, and Mr. J. B. Gardner.

Mr. BIERSTADT exhibited negatives duplicated by the graphite process, and prints made from them. He stated that by this process the negative could be made stronger than the original, or weaker if desired.

The PRESIDENT said that one of their photographers had invented a process which would prevent the blistering of paper, however heavily albumenised it might be. He added liquid ammonia to the fixing bath. It did not dissolve the albumen, but softened it and rendered it pliable, so that it adhered to the paper. The following was the formula:—

| | |
|---|---|
| Water | 2 quarts. |
| Hyposulphite of soda | 1-2 pound. |
| Concentrated ammonia | 1½ ounce. |

Fix in this bath about eight or ten minutes.

Mr. DUCHOCHOIS said that using the hyposulphite a little warm, as well as the first washing water, always prevented blistering.

Mr. ANTHONY observed that in these prints the half-tones were a rusty brown. Was not that due to the effects of the ammonia? He proposed to try nitrate of alumina. He had tried it successfully. He suggested washing with nitrate of alumina immediately after toning, before going into the fixing bath. It was very easily made. Saturate nitric acid with carbonate of lime, filter, and add a solution of alum; the sulphate of lime was precipitated, and you had a solution of nitrate of alumina and nitrate of potash combined. That would have to be diluted about three times in using, and it would perfectly preserve prints from blistering.

Mr. BOGARDUS had never been able to find out whether the blister came from the back of the paper or the front.

Mr. ANTHONY said his impression was that, in silvering paper, ordinarily there was a certain portion of the albumen next the paper that was not coagulated entirely. He knew from experience that when you washed a print that had been fixed with hypo., the first water used, if allowed to stand for a day, would deposit a large quantity of albumen. That must have necessarily come from the paper, and a vacuum would be left, or the albumen would be thin in some places. He supposed the water acted either through the paper or through the coagulated part of the film by the action of *endosmosis*, which was a capillary action, and, there being a vacancy between the print and the paper, it accumulated there.

Mr. BOGARDUS said there were two kinds of blisters, in his experience. In one case, the contents of the little bubble appeared to be water, and in the other entirely hypo. When it was water he had very little trouble to get rid of it; but when it was hypo. there would be blue spots in the print.

Mr. ANTHONY moved that the subject of the cause and the prevention of the blistering of prints be referred to the experimenting committee.

The motion was agreed to, and the meeting was adjourned.

## BROOKLYN PHOTOGRAPHIC ART ASSOCATION.

THE first meeting since the summer vacation was held on October 27,—vice-president Hannay in the chair. There was a large attendance, much more so than usual. After the routine of roll call, reading of minutes, &c.

Mr. T. C. Roche exhibited some negatives, and reproductions of the same, made by the graphite process. He also produced some glass plates, which had been coated and exposed under negatives, and proceeded to develope them before the Association by brushing the prepared graphite over the film. The effects were startling, a fine negative resulting from what appeared to be plain glass only. He further explained the method of removing the film from the glass, so that either side of the negative could be used, the reproduction being a reverse of the original, and explained how ordinary negatives could be strengthened by this process, if desired. Samples of the sensitising mixture and graphite used in the reproductions were distributed to all present. Mr. Roche next exhibited some negatives and transparent positives made with a bromide emulsion of his own preparation, no silver bath being used. The plate was flowed with the emulsion, placed in the shield, and exposed. He developed these with the alkaline developer. The results were as fine as could be desired and elicited the approval of all present. These bromide emulsion plates were the first of the kind *ever exhibited in the United States.* The emulsion had no acid of any kind added to it—no gum or preservative. The cotton used was Anthony's soluble No. 1. The plates are more sensitive than the ordinary wet plates. The glass is coated with the emulsion and then exposed in the camera. It developes rapidly by the alkaline method to any desired strength without stains or fog.

A vote of thanks was unanimously tendered Mr. Roche, to which he appropriately responded.

Mr. Barker exhibited some lantern slides which were made during the evening, his light being procured from a magic lantern, with the diffusing lens removed.

After other routine business the meeting was adjourned.

# Correspondence.

### PHOTOMICROGRAPHY IN FRANCE.—APPARATUS, &c.

As soon as the admirable invention of Daguerre became known, and when it was proved beyond doubt that an image or landscape formed on the background of the *camera-obscura* could be fixed, the scientific world was anxious to apply the new discovery to the study of microscopic objects. The microscope reveals to us the secrets of the invisible world. When I say "invisible" I mean the undiscovered one to those who do not attempt to penetrate nature's mysteries by studying that world which teems with the "infinitely small."

Unhappily the microscope gives us only a fugitive glance. The object has but an optical form, and steadfastly looking through the instrument hurts the eye and fatigues the brain. Many have occupied themselves to change this state of things, and many ardent workers have entered

into the field with a strong desire and a firm will to do all in their power to give, as it were, life and stability to that impalpable form.

In France the first who succeeded was M. Donné; afterwards came many others. England, however, has the honour of furnishing the greater number; for the unhappy custom which prevails here of leaving the Government to do everything is, as it were, a "break" on private initiative. Many other *savants* have offered their mite on the public altar; but here *savants* are generally poor, and the study of photomicrography requires expensive instruments, very much time, and materially offers very little remuneration to its adepts. Therefore, very zealous men, and, at the same time, those who can let the "morrow take care of itself"—these alone can undertake with the hope of success that difficult branch of study.

Among other workers in this field I may mention M. Bertsch, whose loss we had to mourn at the same time with that of mutilated France, after the disastrous war of 1871, and M. Lackerbouer (now no more). At present we have several—among whom I can cite Le Docteur Duschesne; M. Vaillant, Attaché au Jardin des Plantes; our greatly-respected ex-Secretaire de la Société Francaise de Photographie, and M. Aimé Girard, now Professor of Industrial Chemistry au Conservatoire des Arts et Métiers de Paris. All these gentlemen have rendered great service to this important branch, and have come to the assistance of those who have not the privilege of possessing so valuable an instrument as the microscope. They have taken the image formed and enlarged by the objective of the microscope, and have given us the image in a palpable and visible form.

It may truly be said that photomicrography is a complementary science, and at the same time indispensable, to micrography. A very clever artist, it is true, can draw the object formed in the field of the instrument by the aid of the *camera-lucida;* but the human hand and genius is incapable of entering into the lists with light, the mathematical precision of which can give exactly the form of such small objects. The old and oft-repeated reproach to photography, viz., that it is "too brutal," is for me one of the indispensable conditions required for success. Unhappily, every object seen in the field of the microscope cannot be photographed; for the optical arrangement of that instrument—the combination of the lenses—will not permit us to represent the perspective (if I can be permitted that expression) of the object, for only one plane can be sharp and defined at a time; and many preparations—such as botanical, and especially histological objects—are very difficult, and give the greatest amount of trouble without a corresponding benefit.

During the time that M. Jules Simon was Ministre de l'Instruction Publique, M. Rauvier, the celebrated histologist, desired to establish a photomicrographical laboratory in the Collège de France. My humble collaboration was solicited, and soon after I had the organisation and direction of that department. But, alas! the road to success is not always smooth; and perhaps it would not be uninteresting to the readers of The British Journal of Photography to have a short sketch of the "peripatetics" of the installation of that laboratory.

The ancient laboratory of M. Rauvier was placed at my disposal—I can say the bare walls. The first question was—"But where are we to obtain the money?" The disastrous war had swallowed up the resources of this then unhappy country, and it was out of the question to ask for a grant out of the public funds. Nevertheless, I managed to obtain the sum of 1,300 francs, and with that modest sum I contrived to establish a dark room, a laboratory with the necessary chemicals, purchased a second-hand enlarging apparatus with a glass reflector, a camera with a double extending bellows, and other small articles to begin with. After many fruitless attempts to do something better than had been done before us—the inferior quality of our instruments and the weather being very bad were stumbling blocks to success—M. Rauvier declared it to be an impossibility, and withdrew his collaboration, saying he preferred to give his preparations to a draughtsman. M. Fouquet, a well-known *savant*, Attaché au Collège de France, did all he could to encourage me to continue. We worked together, and our united labours were finally crowned with success, for we succeeded (at our own expense) in making some very good photomicrographic prints enlarged direct from the microscope 350 diameters.

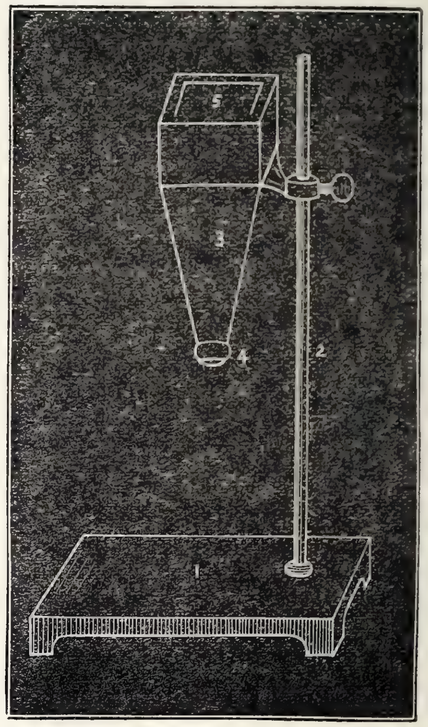
I cannot but compare the two countries in the same case. In France a *savant* has to contend with the Government, the dispenser of all good, and, as it were, to fight with energy and gain a name at his own expense. When he has done this, and not before, he has the privilege to storm the stronghold of the treasury.

M. Janssen, the great astronomer, had the greatest difficulty to fit out his expedition for the observation of the transit of Venus; but, being known, he dared to do that which another dare not do—that is, exceed in outlay double the sum granted. Many times has he said to me—"Happy England, where the public goes in advance of the lover of science! Millions would have been offered to fit out such an expedition in that country; whereas, we are obliged to beg the Government to grant us a few thousands—quite inadequate for the purpose!" So it is in every branch of science in this country. If success crown the labours of any one it is a well-deserved reward due to his merit and a little to his personal fortune; for those who have not that auxiliary cannot succeed unless help comes in the shape of aid from friends.

It is my sincere hope that the photomicrographical laboratory of the Collège de France will, in the course of a few years, render service to science, as it is; its position will only permit us to work during the summer months, and we have the firm intention to work on next summer, as we have obeyed the advice given in the nursery rhyme—"If at first you don't succeed, try, try again." We hope that our efforts will be crowned by continued success.

Several methods are known by which enlarged photographic proofs of infinitely-small objects can be obtained. The best apparatus, perhaps, is a well-constructed *microscope solaire;* but, as every person who has a wish to dabble a little in photomicrography has not always such an expensive instrument at hand, I will give a description of a very cheap and easy mode of obtaining small photomicrographical proofs at home. Any microscope will do, provided it be a good one.

FIG. 1.



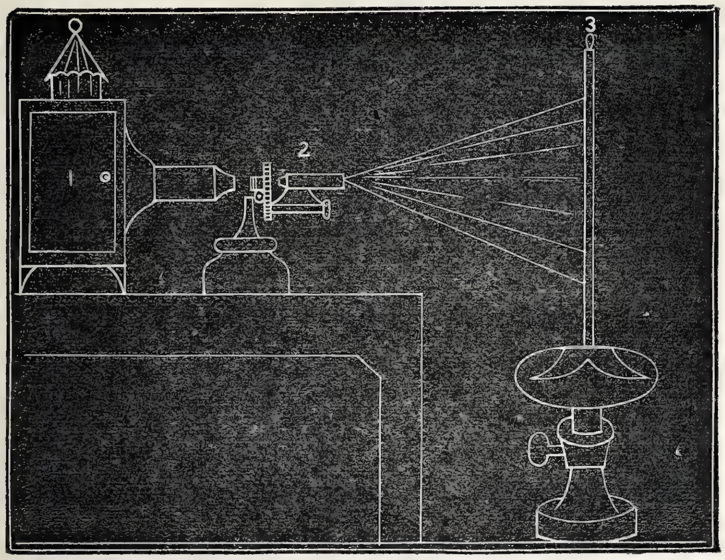
No. 1 is a square or oblong piece of wood, in which is secured a strong brass or iron rod, No. 2. On this rod rides a screw to which is firmly attached an ordinary small *camera-obscura* having a conical prolongation, No. 3, at the lower part of which is an india-rubber cap, No. 4, into which slides the upper part of the microscope, and which, fitting exactly, prevents the passage of light. The upper part is made as an ordinary portrait camera, with ground glass and one or two dark slides. It would be well to line the inner surface with black velvet, in order to prevent any reflection from it.

The microscope is placed on stand No. 1, the top part (without the "ocular") is pushed into the india-rubber cap, the preparation is placed on the "platine," and the light reflected through the instrument by means of the mirror; the enlarged object is then seen on the ground glass, No. 5. The greater the distance of the ground glass from the preparation the larger will be the proof. This can be photographed either by the wet or dry process.

The sun's rays can be advantageously replaced by artificial light, and I doubt whether it is not the best; for it is always under control, you can work when you please, and, in fact, you are better able to judge the necessary time of exposure.

No. 1 is a lantern in which is consumed oxyhydrogen gas; No. 2 a folding microscope; No. 3 the dark slide holding the dry plate.

FIG. 2.




In another article I will give a description of the photomicrographic apparatus employed at the Collège de France, also, a new apparatus invented by M. Aimé Girard. E. Stebbing, *Prof.*

3, *Place Bréda, Paris, December* 26, 1874.

## DAGUERREOTYPES.

*To the* Editors.

Gentlemen,—As an old daguerrean I cannot remain silent after reading *Foreign Notes and News* in your valuable Journal of the 25th instant. You say:—"Let it, then, be understood henceforth that the collodion process is for artists and not for *savants*, and let the latter lose no time in giving it up for the silver plate."

After years of experiment, practical working, much talent, and money which has been expended on the collodion process—I may say ten thousand fold more than was ever given to the daguerreotype process—you recommend (on the eve of the year 1875, just thirty-six years after Daguerre's invention) *savants* to "lose no time in giving it up for the silver plate." This is a great point gained for the daguerreotype.

My argument is—In consequence of its greatest possible accuracy and highest technical excellence should we not, *at least for photographic miniatures,* also give up collodion and return at once to the most beautiful truthful, and lasting of all sun-drawing from life, viz., daguerreotype.

No glass or paper photograph can compare with a good daguerreotype for rendering texture, therefore expression and the likeness must be infinitely more perfect and pleasing than any paper miniature with the hundred-and-one "fakements" which have been introduced to make them passable.

For many purposes of the artist—such as for enlargements, quick multiplying, &c.—there is no doubt that collodion has its own specialities, and wonderful has been the progress therein; but for miniature portraiture I contend the daguerreotype is *par excellence.*

I would suggest that early in the coming year there should be an exhibition of daguerreotypes—say at the South Kensington Museum or other suitable place—when a large collection might be brought together that photographers and the general public might have an opportunity of seeing what was done a quarter of a century ago. I for one shall be most happy to contribute both miniatures and views, which are as fresh and perfect now as the day when finished.—I am, yours, &c.,

*Pen-y-Bryn, St. Asaph, December* 28, 1874. W. G. Helsby.

## THR DETERIORATION OF GAS BAGS.

*To the* Editors.

Gentlemen,—A perusal of your leader on this subject in last week's Journal caused me to make an immediate examination of an india-rubber bag which I have had in occasional, indeed frequent, use during the last three years. Unscrewing the tap I gave the bag a violent shaking, but failed to dislodge a single grain of the dreaded brown powder. It was really more than I expected, for I have been in the habit of allowing the oxygen gas to remain stored in the bag for several days in succession.

But I write to mention that I have always dissolved about a table-spoonful of bicarbonate of potash in the purifying water, and I believe this has materially hindered the destruction of the bag. I have taken every precaution against the introduction of water. Let me recommend a large, long tube between the purifier and gas bag, and that the former be put on the floor and the latter on the table.

The badly-constructed purifiers made of japanned iron, commonly supplied by lantern dealers, are often the cause of the introduction of water into the bag. It is far better to use a large, wide-mouthed bottle or jar with a well-fitting cork pierced with two holes for the inlet and outlet tubes. Let the inlet tube be perforated round the bottom with a number of small holes.

In a glass purifier the action of the gas can be watched and the heat reduced in due time. In a little while the water will be seen to assume a darker hue, which will increase until the operation is over, when it will have become as black as ink. Eventually this deposits a thick, dark sediment. Is it chloride of potash?

My object in adding the bicarbonate of potash has been to render the gas less corrosive in its action on the brass tap, which is apt to turn very stiffly. It now seems likely that I have preserved the gas bag at the same time.—I am, yours, &c., Edward Viles.

*Pendryl Hall, December* 29, 1874.

## "THE NEW LENS."

*To the* Editors.

Gentlemen,—Referring to the citation in my last letter of an authoritative opinion on the patent for my rectilinear lens, Mr. Wenham remarks that the stability of a patent is in no way established by the opinion of agents; this may be so, and it follows, *a fortiori,* that the opinion of a confessed infringer is of still less value in proving the *in*validity of a patent.

The probable validity of a patent *does* derive considerable weight from the opinion of an expert in patent law, but its actual validity can only be established by appeal to a legal tribunal; and, as discussion on this subject can only concern manufacturers of lenses, I must decline entering into a correspondence with Mr. Wenham in your Journal, being quite satisfied to accept the award of a tribunal which can give the force of law to its decisions.—I am, yours, &c.,

19, *Bloomsbury-street, London, W.C., December* 29, 1874. J. H. Dallmeyer.

## THE PORTRAITS OF EMINENT PHOTOGRAPHERS.

*To the* Editors.

Gentlemen,—In announcing your intention of giving portraits, periodically, of those who have acquired eminence in connection with photography, will you permit me to observe that the course upon which you have determined, while it will prove immensely gratifying to your readers, will be apt to cause a considerable amount of jealousy among the smaller class of men attached to photography. Each of us, in the laudable desire to appear a Talbot or a Daguerre in the eyes of the world, will, I fear, be inundating your columns with discoveries and suggestions which if new may not prove worth much, and if valuable may not be original.

Pray let it be known that eminence in photographic invention or discovery is not to be acquired by the recommendation of a tannin preservative of a greater or less strength than that hitherto used, by the doubling or diminishing the strength of a developer, or by the substitution of plush for velvet as a material of which to make a focussing-cloth.

I might speak of other qualifications for eminence, but I have never seen anything to warrant me in imagining that the conductors of your Journal are likely to be swayed by considerations of a pecuniary, social, or political nature.—I am, yours, &c., West End.

*December* 30, 1874.

[Our correspondent may rest assured that the portraits we issue will be acceptable to every reader of this Journal.—Eds.]

The Transit of Venus.—Capt. Abney, special correspondent of the *Daily News*, writing from Thebes under date Dec. 9, 1874, says:—"As it got near sunrise every telescope was pointed towards the spot where the Sun was expected, and at last he made his appearance in a delightfully bright sky. Almost immediately Colonel Campbell shouted out 'Here she is!' and then there was a general finding of Venus. She appeared anything but a promising subject for the purpose at first. She seemed literally to dance about the face of the sun, and her limb was jagged like a saw. They both appeared elliptical in an almost extraordinary degree, owing, of course, to refraction, and they did not lose it entirely till they were at least seven degrees from the horizon. Gradually the limbs of both got more and more defined till Venus looked like a small black pea resting on a luminous disc. The sun, however, still remained somewhat troublesome, particularly to the photographers, and it was not till just before internal contact that he was really steady. The atmosphere of Venus was distinctly seen at certain periods. It showed as a pale white circle round part of her edge, and was totally different to the brilliant sunlight. The general remark was that it reminded us of moonlight. This caused a certain difficulty in estimating the true time of contact, and perphaps any small discrepancy in observation may be accounted

for by this phenomenon. The critical time for the photographers was when they had to expose for the time of contact. Colonel Campbell had agreed to give a certain signal, while Dr. Auvers, literally in part, deprived himself of making a first-rate observation by kindly supplementing it by another. To estimate the proper time for exposing the circular plate which was to bear fifty photographs on its surface without external aid would have been simply a shot and nothing more. As it is, it is believed that the Janssen plate shows photographically very nearly the true time of contact; at all events it bears sufficient upon it to enable an estimation of the true time to be made with comparative facility. Dr. Auvers took 126 measurements of the diameter of Venus by the heliometer, and then handed the instrument over to Admiral Ommanney to observe contact whilst he stationed himself by the photographic hut with his telescope. There is one curious coincidence to note, and that is that no one seemed to have observed the black drop which has been so much talked about; a faint haze was seen and a few jets of black springing out from each side of the point of contact, but nothing more. Neither in the photographs did it show, which, perhaps, might have been expected. Certainly the weather could not have been more favourable just at the critical time, though, curiously enough, immediately after, a haze came on, which would seriously have affected the results. Need I say that we are all thankful the observation has passed off so well, and if only the other stations to which expeditions have been sent are equally fortunate the sun's distance ought to be definitely settled. * * * After copies of the photographs have been taken the photographic expedition will return home. Colonel Campbell will stay on at Thebes to complete some spectroscopic observations, and Drs. Auvers and Döllon will go up to the first cateract."

## EXCHANGE COLUMN.



## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

*** With the next number will be given the Title-page and Index for our last volume.

P. S.—Your letter is under consideration at present.

J. Dale.—Thanks for the print of the hoar frost on the trees. It is singularly beautiful.

Subscriber.—Any modern good work on chemistry will, no doubt, afford you the desired information.

Stereos.—Thanks. The matter, however, had already received consideration, as you will see in another page.

A. Z.—Your experiments are certainly very curious, and we shall be glad to publish the results as soon as they are completed.

Opticus.—Mr. Dallmeyer's patent—that on which hangs the present discussion —will be found *in extenso* in our volume for 1867, page 246.

Verdant Green.—The silver may be prevented from accumulating in drops on the surface of the paper by blotting it off when excited.

G. C.—The pictures are good, although in the estimation of many persons they would be considered too cold in tone; this arises from over-toning.

W. H. M. (Milwaukie, Wis.).—Draft received with thanks. The Journal for 1875, and two copies of the Almanac will be forwarded in due course.

Reuben.—You ought to have your blinds attached to spring rollers, which, together with the brackets and all necessary fittings, may be obtained at any blind-maker's establishment.

J. Brown.—That a drop is not necessarily a minim may easily be proved to your satisfaction by dipping a rod respectively in oil and alcohol, and measuring the bulk of a drop from each.

T. W. H.—Some lenses will cover a great deal more than their makers advertise them to do. For example, we have what purports to be a 5×4 lens which covers, with a small stop, 7½ × 5, giving good definition in every part.

Scotsman.—The acetic acid respecting which you inquire is in strength equal to Beaufoy's acid, or about one-third the strength of glacial acetic acid. It is usual in America to indicate the strength of acetic acid by numbers.

M. F. M.—An achromatic lens may be made of crown glass alone as well as of flint glass alone; but two different kinds of crown glass must be employed in the construction of the lens, one of them having more dispersion than the other.

W. G.—The only method we can suggest is for you to purchase a bellows body ready made, and then subject it to such critical examination as will enable you to understand its construction, when you will be in a position to make others.

H. L.—We fear that, even if time permitted, an article on "explosive and dangerous compounds" would not be generally acceptable to the other readers of the Almanac. You will find the required information in Cooley's *Cyclopædia*.

Oxygen.—There is no reason to suppose that your gas bag will not remain good for several years. Turn full on the tap at the bag, and regulate the light by that which is attached to the burner. See also Mr. Viles's letter in the present number.

R. F.—This correspondent writes asking if positive printing on albumenised paper could not be effected during this dull weather by means of development. In reply, we observe that it is not only quite possible but very easy to print in this manner; but the results lack the beauty and delicacy of sun prints.

J. B.—In trying to produce "magic photographs" you failed from a very obvious cause, viz., using prints which had previously been toned. The directions given by us were sufficiently plain in this respect, for we said that the print to be rendered invisible by the mercurial bath was one which must have been fixed *but not toned*.

Samuel M'George.—We have not the least doubt of the cause of the fogging and streaks upon the negatives being from the use of a gutta-percha bath. A bath of this material will answer quite well for many purposes in photography, but it ought never to be used as a receptacle for silver solution intended for the exciting of a collodionised plate.

One Who Contributed to the Last Exhibition.—You are quite right in your surmise. So far from the production of life-size direct heads being of the recent date stated, we are aware of pictures of this kind having been made ten years ago, and one of our correspondents refers to the fact that several life-size direct portraits were exhibited at the International Exhibition of 1862.

R. W. B.—The best height is from seven to seven and a-half feet at the sides. Let the window in the east be five feet high and about ten feet wide. This window must be provided with two semi-opaque screens, each one capable of covering the entire window. By this arrangement any desired working aperture may be made in the window, by which the effects desired will be obtained.

D. Welsh.—To transfer the collodion positive to leather let the surfaces both of the leather and the picture be made wet with spirits of wine, containing a drop or two per ounce of nitric acid. Then press the two in intimate contact, taking care that all air-bubbles are removed. When dry they may be separated, and the picture will then be found attached to the leather. Black japanned cloth will answer as well as leather for the purpose.

C. S.—We must in fairness to all parties decline giving any opinion whatever about the value of the business. Our good nature in the direction of the readers of The British Journal of Photography does not extend so far as spending several hours of our time in wading through the books of a business merely to confirm a statement relative to the soundness of a commercial "concern." Employ a professional accountant, and please do not forward the books to which you refer.

J. M. (Bradford).—Our correspondent finds that his toning-bath, which has long been working well, and had been strengthened only two days ago, has suddenly become quite inert. He observes a slight precipitate of a brownish colour, and asks if that has anything to do with the cessation of the toning powers. He is quite at a loss as to what to attribute this suspension, unless it may have arisen from a few drops of iron developing solution which he thinks inadvertently got access into the bath. This affords the key to the solution of the difficulty. The presence of the salt of iron ensures the precipitation of the gold in a metallic form (the brown precipitate referred to), and hence there is nothing left in the toning-bath which retains the power of toning.

Dallastype.—We understand that the process of producing surface-printing blocks by means of photography known as "Dallastype" is very shortly to be divulged on easy terms to those persons desirous of "going in" for this kind of photographic engraving. Mr. Dallas has, we believe, now reduced it to a process combining simplicity with certainty.

Destruction of a Photographic Establishment by Fire.—About twelve o'clock on Monday night last a very destructive fire occurred at the establishment of Mr. M. Fryer, photographer, Bolton, by which the whole of his stock and apparatus were destroyed. The studio, which was a wooden structure, together with the shop underneath, was completely gutted, not a single article being saved. The damage is estimated at some hundreds of pounds.

## METEOROLOGICAL REPORT,

*For the Week ending December* 30, 1874.

Observations taken at 406, Strand, by J. H. Steward, Optician.

These Observations are Taken at 8.30 a.m.

| Dec. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 24 | 29·57 | S | 34 | 36 | 37 | 29 | Snow |
| 25 | 29·78 | NW | 36 | 38 | 38 | 34 | Dull |
| 26 | 30·00 | NW | — | 30 | 36 | 27 | Dull |
| 28 | 30·25 | W | — | 31 | 35 | 29 | Cloudy |
| 29 | 30·23 | E | — | 28 | 30 | 26 | Cloudy |
| 30 | 30·31 | SE | — | 26 | 30 | 25 | Foggy |

### CONTENTS.

# THE BRITISH
# JOURNAL OF PHOTOGRAPHY.

No. 766. Vol. XXII.—JANUARY 8, 1875.

## ARCHER.

In deference to the wishes of our well-known contributor, Mr. Sutton, we last week allowed him the unrestrained use of our columns in order to fulfil the promise he made to the late Mr. Bingham respecting the publicity he desired to give to certain claims advanced by that gentleman in connection with the discovery of the collodion process. But, having done this, it is now our duty—a duty the fulfilment of which was last week rendered impossible by severe pressure on our time—to make such comments on Mr. Sutton's narrative as, we think, will compel the reader to conclude that no foundation exists for either the implied, if not plainly expressed, imputations against Archer on the one hand, or the claims now for the first time presented on behalf of Bingham on the other. We cannot imagine that Mr. Sutton would really desire to act unfairly towards either of these gentlemen, and hence we conclude that his article was merely the result of imperfect information, and that his detraction from the claims of Archer arises rather from an impulsive desire to serve the memory of a deceased friend than from a deliberate intention to injure the character of the former.

Equally with Mr. Sutton would we feel bound to listen to the utterances of a man upon whom the hand of death was firmly laid; but in doing so we must not allow mere sentiment to assert a claim over both probability and recorded facts. We all know that at such a time reason is apt to become beclouded; and statements made under the circumstances must be received only for what they are worth.

We have weighed the probabilities of the statements made by Mr. Sutton on behalf of Bingham, and have been compelled to reject them as quite untenable; and in this we are borne out by published records which emanated from Bingham himself. For a considerable period after Archer had produced many charming pictures by the collodion process, Bingham had apparently failed to grasp that process; for in one of his manuals of photography published two or three years subsequent to Archer's publication of his beautiful process Bingham only alluded to collodion, in juxtaposition with *spirit varnish,* as a vehicle that might be employed, although he at that time was aware of the peculiar advantages of Archer's pyrogallic acid developer. But as to Bingham having had at that time any practical acquaintance with the collodion process no evidence whatever exists, but much probable evidence to the contrary. It must be remembered that Archer's first publication was made in March, 1851, and that a year afterwards he published a manual of his process (the exact date being March 14, 1852). In that manual he speaks of having previously tried many substances as substitutes for paper in which to impress the negative image, among these being "starch, paper pulp, tanno-gelatine solutions, and several combinations of albumen"—each of which had its turn; but, after repeated experiments in numerous ways, he eventually decided on collodion as being the most valuable substitute for paper. It is really too late in the day to make prior claims on behalf of one who, in preparing a manual of photography two years after that, spoke of collodion in such connection and in such manner as to carry the conviction that he was, to a large extent, unacquainted with it as a main adjunct to a new process. In another page Mr. Dawson has given such a *résumé* of the relative parts played in this discovery by Archer and Bingham as to render it unnecessary for us to pursue it further. Hence we pass to another charge brought by Mr. Sutton against Archer.

Confessing that he never saw any of Archer's productions, never visited him, and did not even know him, Mr. Sutton yet, on confessedly mere "hearsay," takes occasion to say several harsh and, as we shall show, quite unjust things respecting Archer's attainments. The hackneyed axiom, "*de mortuis nil nisi bonum,*" ought not to be allowed to bias one's feelings in estimating the character and attainments of any man who has ceased to exist; but neither ought the antithesis of the aphorism be allowed to sway the judgment.

Mr. Sutton says:—"When he" (Archer) "was left to run alone in experimenting he seems to have dabbled in optics in a foolish way which led to nothing, and to have lived in a general muddle, in the midst of which he died, leaving his family destitute." Passing over the fact that if there be one thing better known than another in connection with the history of inventors and discoverers it is that few of them have died wealthy, and that their not doing so does not entail any reproach on their memories, we proceed to make a few remarks on Archer's alleged "dabbling in optics."

It happens that we are in a position, from personal knowledge, to narrate what resulted from this "dabbling" which Mr. Sutton couples with the adjective "foolish." Two inventions resulted which, whether they were "foolish" or not, were both afterwards re-invented, in a modified form, by Mr. Sutton himself. The latter gentleman had not, probably, been aware of them at the time; but with such inventions he is, if we rightly understand the tenor of what our friend has at various times written, by no means disinclined to have his name associated. One of these is the triple combination, the other being an achromatic doublet composed of menisci the crown elements of which are plano-convex. That Mr. Sutton certainly attached much importance at one time to this form we know on the best of all evidence—an article written by himself several years back; but that Archer made several doublets on this principle we are also well aware, one of them, made and sold about 1853, *being now before us.*

Archer, in the early days of his invention, made a speciality of portrait lenses in which there was no flint glass, the correcting power of this kind of glass being obtained by the substitution of fluid possessing a certain degree of dispersion. Showing one of Archer's "fluid lenses" in our possession to an optician of great eminence, he exclaimed, after testing it—"What wonderfully good correction Archer has been able to obtain!" Another of equal eminence said—"It is singularly ingenious, and must work well; that man has taken immense pains with his lenses." That the principle of using fluids in the construction of photographic lenses was not considered by Mr. Sutton as very objectionable may be deduced from the fact of his taking out a patent himself for a fluid lens, although differing in form from that of Archer, long previously in existence.

Further: in Archer's triple combination the central lens was a plano-concave, plane side towards the front. That this is neither a

form nor a method of placing such a lens as to warrant its original introducer to have the epithet "foolish" connected with his optical pursuits may be presumed when we say that it is a form and position patented by one of the two leading London firms of opticians, and a form and position adopted in practice by the other of these firms, and, let us say it with bated breath, not considered unworthy of Mr. Sutton's own special claim on his *own* behalf—a claim the existence of which is well known to readers of photographic literature of the last few years.

On the whole we are not sorry that Mr. Sutton, by his unexpected attack upon Archer, has afforded the opportunity for giving what we know to be a few simple facts connected with the inventions of the late Mr. Scott Archer.

## PHOTOGRAPHY IN THE SNOW.

For a landscape painter who is an enthusiast in his art nature has always charms, no matter what may be the season, what the hour, or what the kind of scenery in which he finds himself placed. Summer and winter, spring and autumn, sunrise, midday, and sunset, mountain and moor, lake, river, and ocean—no matter to him—his pencil is always ready, and his eye keenly observant of pictorial effect.

The same remark would be equally true of the enthusiastic landscape photographer but for some unfortunate shortcomings of his art which at present cripple his energies and damp his ardour. His process is not rapid enough, nor does it yield that full scale of gradation between the highest lights and the deepest shades of the picture which nature demands for a truthful reproduction of herself. We are still in the infancy of our beautiful art, and must do the best we can until some fresh discovery in negative-taking turns up. But, in the meantime, there is much that we *can* do tolerably well, and we should not at the approach of winter put away our cameras and pack up our chemicals because the temperature is getting low and the days dark. When the snow is on the ground, and the icicles are hanging from the eaves, and the window-panes are covered with feathery crystals of frozen dew, there is much to be done with the camera by those enterprising spirits who can brave the cold and do not mind a little chill to their finger-tips. In short, the winter has its charms as well as the summer to the true lover of nature, and there is no season when the camera ought to lie absolutely idle upon its shelf; for we can but try and do our best, and are certain to learn something by the experiment, whatever may be outside the yellow window of our dark room or tent.

Full of these reflections we were ourselves tempted the other day to have a little photography in the snow, with the common wet process. The sky was leaden, the light bad, the ground white, the house which was our test object very dark, and its roof the highest light in the picture. We coated our first plate, and found it take a longer time than usual in the nearly ice-cold bath to acquire a creamy film. The first exposure was too short to bring out the details of the house; but all the high lights showed capital gradation, and the white roof came out well against the darker sky. What a pity that there were not a few more details in the dark house, for it would print almost like a black patch! The second plate had a much longer exposure, but then, alas! although the house came out well, the roof and the sky were nearly of the same tint, and all the delicate gradations of the snow were lost. And thus we went on trying experiments in order to increase, if possible, the scale of gradation between the highest lights and the deepest blacks, but never succeeding as we wished. Of course, a very good result could have been obtained by double printing from two negatives; but we were anxious to try and conquer the difficulties upon a single plate.

One curious fact learnt is worthy of notice. Our negatives were very free from pinholes after being fixed, but several came in the final washing. The cause of this was soon ascertained; it proceeded from the washing water freezing upon the plate. Crystals of ice would form, radiating like a star-fish from a central nucleus, and then would appear the clear spot where the film had been broken. The remedy was, of course, to wash the film with tepid water. If the truth must be told, we then longed for some daguerreotype plates, but these are nowhere to be had for love or money. Surely it would be worth while for some enterprising firm to attempt to reintroduce this useful and beautiful process, and keep the necessary requirements in stock.

## A MATT VARNISH AND A NEW INTENSIFIER.

Mr. Kinsley has lately been kind enough to give us two formulæ—one for a matt varnish, the other for a negative intensifier, both of which he finds very useful in his profession as a portraitist. Our only regret is that, although the ingredients are pointed out clearly enough, their proportions are left very much to the taste of the operator.

The matt varnish is made by mixing together common spirit varnish, methylated alcohol, and castor oil. The proportions in which our first experiment was made were tolerably successful. We took a half-ounce phial, half-filled it with methylated spirit, and added ten drops of castor oil. By shaking up well together these mixed perfectly. The bottle was then filled with the spirit varnish, and the whole shaken up again. A cold plate was then coated with it, and the film gently blown upon as it set. The result was a capital imitation of ground glass, tolerably fine and free from grain. When quite hard and dry we found that it could be written upon in lead pencil pretty well; but, not being ourselves very skilful retouchers of negatives, we are fearful of recommending it too strongly for that purpose. As a means of making a good focussing-screen this varnish can certainly be recommended to the photographic tourist; but, as a backing for transparent positives, there is still room for improvement. What is required is a backing which shall be *perfectly* uniform and *entirely* free from grain. Some simple means of applying successfully a thin film of white wax to the glass plate will probably be the best solution of the problem.

Mr. Kinsley's intensifier for negatives is rather a chemical curiosity, and we think it decidedly new. He has kindly given us a bottle of it to try. It is a clear solution, of the colour of sherry, and without the slightest precipitate. We took a stereoscopic negative by the common wet process and, after fixing and washing it, poured over one half of it some of this magic intensifier. This very quickly changed the colour from a fine *non*-actinic brown to an actinic purple something like common writing-ink in tone; and our impression is that the *un*-intensified half of the plate would yield the pluckier print of the two. This was not encouraging, and did not, certainly, bear out the high praises which the new intensifier had received at the hands of its discoverer. The formula is rather a peculiar one, for the solution is composed of chloride of platinum and protosulphate of iron, but in what proportions we are not told. The platinum salt is, perhaps, greatly in excess of the iron reducing agent.

It may be worth mentioning that the nitrate bath used in the above experiment was one which had been given to us lately by an amateur who had put it away fifteen years ago and forgotten it. After with difficulty removing the stopper of the bottle we tested the solution and found it thirty grains to the ounce and very acid; so a little bicarbonate of soda was added to it, and it was left for a day or two in the light. This old bath, thus treated, worked splendidly. It gave a negative, with bromo-iodised collodion and an iron developer, of a rich brown tint and which had that fine creamy surface bloom which is characteristic of pure chemicals. Let no one, therefore, despair of an old negative bath; for who knows but it may work well after fifteen years of quiet in some dark corner, and then treated as we have described!

## FRESH FIELDS FOR PHOTOGRAPHIC ENTERPRISE.

"Pray vote for little Clara; she says she is going to be always good now, except sometimes." Such was the neatly-lithographed inscription on the portion of a *carte de visite* generally occupied by the name of the photographer, which a friend showed us a few days ago. In the centre of the card there was a pretty little vignetted face, a laughing little mouth and dimpled chin, evidently belonging to a

child five or six years of age, of rare beauty—just the kind of pawky face likely to command forgiveness, no matter how often the possessor may forget her promise to be "always good." On a cursory examination the vignette seemed an ordinary silver print of more than average quality; but when more carefully examined it was seen to be printed in carbon, and directly on to the card—a fine specimen of mechanical printing. The opposite side of the card was well-nigh covered with a lithographed statement of the object for which it was issued, namely, to secure the election of "little Clara" as a pupil of a certain society, giving a brief but lucid statement of her circumstances and claims. Such cards are generally thrown aside, and their purport soon forgotten; but we are certain that the one in question will find a place in many an album, and that on the voting day the friends of "little Clara" will have cause to congratulate themselves on the happy idea of calling photography to their aid in their efforts to secure her election.

We think the manufacturers throughout the country have not hitherto fully availed themselves of the aid which photography is calculated to render them—to the extent, at least, that they might do advantageously; and we believe that if photographers would take the trouble to bring the claims of the art more fully before those specially interested, the result would be a very large increase in the amount of work done. We are aware that in one of the largest iron companies in the world a very complete studio and suitable laboratory is erected on the top of one of the buildings; and have been informed that every new pattern coming from the casting-houses is hoisted to the studio and photographed, and that a print is then sent to the engraver by whom the pattern was prepared. In thus doing by the camera the work that had previously been done by more than a dozen good draughtsmen the company save a considerable amount during the year. Now, however, that mechanical printing has been brought to such a degree of perfection, there is no necessity for the intermediate agency of the engraver, as the negative may be sent at once to the printer, who will produce prints infinitely more suitable for the purpose, and effect a saving of several hundred pounds per annum.

But of all manufacturers the upholsterer and cabinet-maker would, we think, find it to his interest to add photography as a department of his business, more especially where the latter is on a large scale. With the exception of a few standard articles the fashion in furniture is constantly changing, and new designs are daily being introduced, so that a pattern-book, in the ordinary sense of the word, is an impossibility, or, at least, would require to be renewed so frequently that the cost might seriously interfere with the profits. By the aid of the camera, however, a sufficient number of copies of each new design could be easily and rapidly produced at a trifling cost, and would, we believe, aid in increasing the business of the proprietor.

We recently visited the establishment of an extensive firm of upholsterers, and there saw the camera turned to very good account. We were told that the firm had large transactions both at home and abroad, and that in many cases orders were received to furnish a house or a single room from parties with whom they were unacquainted, and residing at such distances that a personal visit was out of the question. Photography, however, makes the matter very simple and satisfactory. A well-lighted saloon in the rear of the show-rooms is fitted up as a dining, drawing, or bed-room, with all the necessary articles of furniture and upholstery, including a number of elegantly-framed engravings, of all of which a photograph is taken and sent to the persons interested. In this way they are able to see at a glance not only the designs of the various articles proposed to be sent, but also to form an idea of the effect of the combination as a whole. Our informant assured us that the system had worked to his entire satisfaction, and, what he considered of much more importance, also to the satisfaction of the *clientèle* of the firm, the only drawback being, he added, the want of colour, which was occasionally a cause of difficulty in connection with the carpets.

What has been said of the ironfounder and upholsterer applies, in varying degree, to the manufacturers of all articles the designs of which, to meet exigencies of taste and the changes of fashion, require frequently to be varied. That photography has not been more extensively used in this direction is, we believe, entirely due to a want of knowledge of its capabilities on the part of those most interested; and we think it would result in benefit to all concerned if photographers took advantage of every opportunity to press the matter on the attention of manufacturers generally.

## GELATINO-BROMIDE EMULSION.

Gelatine, albumen, gum, &c., all belong to the family of preservatives for dry plates, and their special merits are pretty well understood as used for that purpose; but the latest idea is that of applying them to the formation of emulsions. The albumen process with a collodion substratum has given most excellent definition; but, like all good things, it has its drawbacks. From the cleaning of the glass to the exposed plates the many manipulations bring with them defects and blemishes unless the operations have been conducted with the most scrupulous care and under the most favourable conditions.

But to make an albumen emulsion is a very difficult matter, and quite impracticable from a photographic point of view. If, however, we substitute gelatine for albumen we have most of the good properties of the latter substance together with the additional one—that if made into solution with water it is very fluid when warm, and assumes the form of, or, rather, becomes, a jelly when cold. This is a decided advantage over the other substances mentioned, and gives it the additional one of being practically utilised in emulsions. Many gentlemen have contributed their mite of discovery. Mr. Burgess and Mr. Kennett really presented the thing in a practical working shape; but Mr. King is none the less a pioneer, for the "how" it can be well done has been explained by that gentleman.

In working from Mr. King's formula, and, indeed, from all the hints I could collect from other quarters, I have been enabled to make the gelatino-bromide emulsion plate. As to getting, however, intensity sufficient for a good printing negative, I cannot say so much for Mr. King's mode of working, or Mr. Kennett's either, but by working it after the fashion of the *collodio*-bromide emulsion process, introducing a chloride instead of wholly using a bromide, I am enabled to obtain printing density in the negative; indeed, my best experiment was with two drops of hydrochloric acid to the ounce of emulsion. By using a chloride or hydrochloric acid, however, an excess of silver in the emulsion brings fog, and all the disasters that constitute failure. In this much it differs from a collodion emulsion.

The mechanical property of retarding a chemical mixture belongs to gelatine more than to any other substance; for if a hot solution—say twenty grains' strong—have ten grains of bromide of potassium incorporated with it, this having again to unite with fourteen grains of nitrate of silver, and if the silver be added in solution to the gelatino-bromide solution, a flocculent bromide of silver will most likely be formed, which no amount of beating with a glass rod will convert into a smooth, homogeneous paste. Indeed, if the bromide solution be added to the silver it is not probable that a better result will follow.

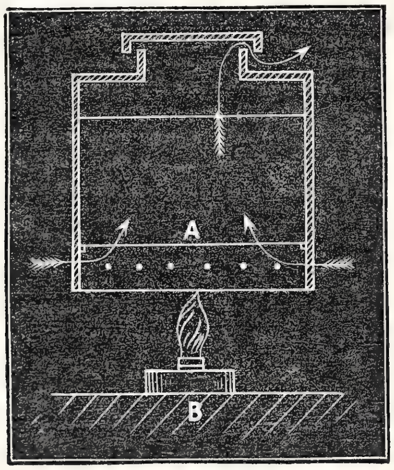
But to accomplish what is desired dissolve twenty grains of Nelson's gelatine in half-an-ounce of distilled water. After the gelatine has soaked in it for three or four hours dissolve the silver in the least possible quantity of the remaining half-ounce of water, and what is not used is allotted to the bromide. Take ten or twenty drops of the gelatine solution and triturate the silver well with a glass *pestle*; you can now add the bromide solution to the gelatine solution, and continue dropping in the silver gelatine mixture; triturate thoroughly, and a beautiful creamy paste will be the result. You can now either adopt Mr. King's method of dialysing it to free the nitrate of potash that would crystallise on the face of the plate if not removed, or, as Mr. Kennett does, pour it into a dish, to set, to the depth of a quarter of an inch; strip it off, and wash the pellicle in many changes of water. Now put into a bottle, and make it liquid by warming it, or leave the cork out of the bottle, allowing the surface to dry like parchment, which it will do, and thus protect the mass from decomposing. If on this a little water containing a trace of carbolic acid be teemed it is protected from decomposition like a housewife's black currant and other preserves. It is thrown off before the gelatine emulsion is warmed for use. Mr. Kennett's method of drying has been patented, but you can allow the emulsion to remain on the septum of the dialyser (see Mr. King's gelatine bromide in last year's Almanac) and become quite dry.

The best and most convenient way to proceed is to pour the gelatine emulsion on to a plate (a large dinner or soup plate is very handy). Say the emulsion sets to the depth of a quarter of an

inch; it is then removed by a strip of glass, cut up into pieces, and placed in a paraffine lamp glass having a cloth tied over the bottom, so that when the pieces of pellicle are put into it they are well washed and freed from the objectionable nitrates. The glass can stand in a jug to keep it in its upright position, and the overflow water runs over the edge of the jug. The paraffine lamp glass can be removed, and the pellicle becomes dry without any trouble or attention on your part.

Coating the plate with emulsion is easy enough. First breathe on it, or allow the steam from a jug of hot water to condense on the face. No. 1 is taken off the hot-water jug; No. 2 is then put on to keep the water from cooling; and the work of coating goes on smoothly enough. Make an evenly-planed board to swing like the pan of a large pair of scales; your plates can be put on it to set, which they do in a very few minutes, and from thence they are transferred to a plate box with the bottom cut out, made to stand so that the film sides of the plates are bottom downwards. By this means dust has less chance of resting on the film side. If you utilise heat to dry the plates they may chance to run on the glass to an uneven thickness, even if most carefully levelled. A drying-box that admits of a current of dry air to pass through is most convenient; by this means the moisture is carried away. I may here add that no drying-box that does not allow a constant change of air to pass through it is of much good, even for a collodionised plate.

Two or three years ago I illustrated a box of my design, which came into favour and was used by many; but others declared that the diagram did anything but illustrate its virtues. I here, by aid of the annexed diagram, give a modification which I have at present in use, and which answers every desired end. The sketch shows the box cut through the middle.




The spirit lamp burns on to a sheet iron bottom. **A is a sheet of** perforated zinc covered with a piece of red tammy. The air is admitted into the box through a number of holes bored in the side, just below the perforated zinc A. The heat from the iron bottom causes the air to circulate in and out of the box in the direction shown by the arrows. Abundance of air can pass freely both in and out, but no light can enter. B is the spirit lamp or Bunsen burner. The box is intended to be square on the top. The "trap" is a contrivance known to all magic-lantern workers; or any bricklayer or plumber who has meddled much in sanitary matters will be able to explain all that is meant by the construction. I must not omit to mention that the perforated zinc A is movable. It is better to dust it frequently; indeed, the box will be all the better for an occasional application of that nature.

Anyone thinking of experimenting with gelatine emulsion had much better obtain a sample of Mr. Kennett's manufacture. He will then be in a position to know the meaning of the word "success;" indeed, if Mr. Kennett's pellicle surpasses the wet process in rapidity, I can hardly claim to have been successful in it. Had not such extremely bad weather set in at the end of the old year I might have been in a position to speak more accurately of the capabilities of my gelatine emulsion containing a chloride in conjunction with a bromide.

J. W. Gough.

## THE EARLY HISTORY OF THE WET COLLODION PROCESS.

I am far from satisfied with Mr. Sutton's account of the discovery of the wet collodion process, as given at page 4 of The British Journal of Photography for January 1, 1875. When he wrote that impressive statement he could not have been cognisant of the printed and published documents which still exist, and most of which I have in my possession, showing that to the late Mr. Archer belongs (I may say) exclusively the credit and honour of having given a new and vast impulse to the progress of an art which has "brought grist to the mill" to many thousands, and the productions of which have been the solace and joy of millions of our fellow-creatures.

The following appear to me to be the main facts bearing on the case in hand, and, if there be no others forthcoming of importance, the conclusion to be arrived at is obvious.

In the number of the *Chemist* for March, 1851, the first published account of collodion as a practical photographic vehicle appears. That article was written by Mr. Archer, who, in a previous communication to the same journal, had made known the great power of pyrogallic acid as a developing agent. The following is the communication alluded to:—

"The imperfections in paper photography, arising from the uneven texture of the material, however much care may be taken in the manufacture of it, and which from its nature, being a fibrous substance, cannot, I believe, be overcome, has induced me to lay it aside and endeavour to find some other substance more applicable, and meeting the necessary conditions required of it, such as fineness of surface, transparency, and ease of manipulation.

"A layer of albumen on glass answers many of these conditions, producing a fine transparent film, but it is difficult to obtain an even coating on the glass plate; it requires careful drying, and is so extremely delicate when damp that it will not bear the slightest handling; besides these objections, the necessity of having a large stock of glass when a number of pictures are to be taken, is much against its general use. My endeavour, therefore, has been to overcome these difficulties, and I find, from numerous trials, that *collodion*, when well prepared, is admirably adapted for photographic purposes as a substitute for paper. It presents a perfectly transparent and even surface when poured on glass, and being in some measure tough and elastic will, when damp, bear handling in several stages of the process.

"I will now give a short outline of my mode of using it. The first step in the process is to prepare the solution of collodion. There are several ways of doing this, but I will briefly allude to two.

"Pour a quantity (say one ounce) of collodion into a bottle containing dry iodide of silver to settle. The collodion will, in this way, take up a certain quantity of the silver salt, and become opaque; it should then be transferred to another bottle containing iodide of potassium, to be again well shaken up until the iodide of silver is entirely dissolved, and the solution becomes perfectly transparent.

"Or this:—To a solution of iodide of potassium in spirits of wine add a small quantity of iodide of silver sufficient to saturate the iodide of potassium; let, however, the latter salt be in excess. Add a small quantity of this solution to the collodion—between five and ten grains by measure to one ounce of collodion will be sufficient—and if any of the iodide of silver should precipitate a small quantity of iodide of potassium must be added to dissolve it. In this way, or by the former mode, the collodion may be prepared.

"The next step is to spread this solution evenly on a plate of glass. This can be done by pouring a sufficient quantity on the glass to run in a body freely. When it has entirely covered the glass plate let the superabundance be drained off at one corner into the bottle again; this operation cannot be done too quickly, for the ether rapidly evaporating would prevent the collodion running evenly over the surface of the plate, and becoming too thick.

"The plate is now plunged into a bath of nitrate of silver, allowed to remain there for a few seconds, and then washed in water. (This washing is intended to remove all the ether from the surface of the collodion, which, if allowed to remain, would cause an unevenness in the sensitiveness of the surface, producing streaks or spots.) Immediately after washing it may be exposed to the action of light for the time necessary to obtain a picture. This picture can be developed either by gallic or pyrogallic acid. If the latter acid be used a few precautions are necessary, to which I will allude presently. The former acid may be used as a bath, in the ordinary way. After the picture is developed the film of collodion should be loosened from the edges of the glass plate with a flat glass rod. By doing this it will easily separate from the plate, and can be allowed to float freely in the water bath, previous to being placed in the bath of hyposulphite of soda, and then again thoroughly washed."

Further: Mr. Archer, in the preface to the second edition of his work on *The Collodion Process on Glass*, published in 1854, says:—

"Collodion, there is no doubt, early attracted the attention of photographers, but who first actually suggested its use we have no means of determining with any precision. Since, however, its value as a photographic agent has been known and appreciated, many claimants have come forward anxious to obtain a share in the merit of its first introduction.

"There can be little doubt that many of those engaged in the pursuit of photography, anxious to improve the then known processes or invent

others, would very soon have collodion brought under their notice, proceed to test its capabilities as a photographic agent, and possibly endeavour to work out a process by which it could be made available in the art.

"It is, indeed, obvious, from a consideration of its remarkable qualities, that it could not long escape their observation, and we may easily imagine, also, that it would be likely to attract simultaneously the attention of many parties who were labouring in the same field of research.

"It is evident that in deciding a question of this kind the *first published account* must take precedence of any other kind of proof; and it is due to M. Gustavus Le Gray—a gentleman whose great services in other branches of the art of photography are well known, and are held in high regard—to say that he was the first to publish an account of collodion as a photographic agent. I allude to his pamphlet, published in 1850, wherein he mentions collodion and its *possible* use. His first application of it appears to have been as an *encollage* for paper. Afterwards he used it on glass, and gave in his memoir a short account of his researches, but no manipulation in detail was made known, such as would entitle it to be called a photographic process; and from the wording of his published notice it would appear to have been merely an extract from his note-book of chemical experiments. As such it attracted little attention at the time; still M. Le Gray was the first party who, by publication, made known his researches on the subject, and, although this notice did not lead to its practical use, it establishes his claim to be considered the first to suggest its value in photography.

"About the month of June, 1849, I began to turn my attention to collodion as a substitute for paper, with the hope that by its means a surer and more delicate medium might be produced to work upon than paper was ever likely to be.

"I tried numberless experiments with it, and varied the mode of using collodion, with the hope of getting a practicable and sure method of working it.

"These experiments were carried on until the month of March, 1851, when I published in the *Chemist* a short account of my experience in the matter,* giving a process in detail; the mode of preparing collodion with iodide of potassium and silver; the proper strength of the nitrate of silver bath; the best proportion of pyrogallic acid for developing the latent picture, with the manner of fixing the picture produced; in fact, giving the whole process in detail.

It will therefore be evident that, although M. Le Gray has the merit of having been the first to make known this valuable photographic agent, still as he did not, at the time of his publication, produce it as a process with the necessary details to make it intelligible to the photographer, his claim must in consequence be limited, and cannot in justice interfere with the merit of another party, who, from his own experience, made known a process with collodion, and that *without any assistance* from, or reference to, the labours of others in the same field of research."

Nothing could be put more philosophically than these words of Archer's. They must carry conviction to every unprejudiced mind. Archer was not the extraordinary muddling sort of spendthrift that Mr. Sutton would have us believe him to be. He was a genius in the highest sense of the word—ever aspiring to higher things—wrapped up in practical thoughts and works which, alas! he had not the worldly wisdom to turn to his own material advantage. The writer first met him at his house in Great Russell-street, in the autumn of the year 1853, and was shown how to make collodion—it was certainly by a rather rule-of-thumb sort of method, but nevertheless effective. He only once more met him; but on each occasion was greatly impressed with the thorough earnestness of the man.

I will now say a word or two respecting the claim put forward by Mr. Sutton in favour of Mr. Bingham. Messrs. Knight and Son, of Foster-lane, published Mr. Bingham's photographic book, the ninth edition of which (dated 1852) now lies before me. At page 73 he says:—

"We may, in place of the gelatine (isinglass) employ a number of other substances to form an adherent film on the glass. The following are a few of those we have experimented with, and found to answer moderately well:—Vegetable gluten dissolved in acetic acid forms a very tenacious coating and difficult to remove. Collodion (gun cotton dissolved in ether), the spirit of wine, varnishes," &c.

Not a word more about collodion in the whole book! Would Mr. Sutton or any other man have us to believe *now* that Mr. Bingham really worked in Mr. Archer's "den," and actually discovered what Mr. Archer had communicated to the world, and, of course, to Mr. Bingham in particular, more than twelve months previously? The idea is preposterous. Of all men Mr. Bingham, who was publishing photographic books, would, in some one or other of his editions, have repudiated Mr. Archer's claims to be considered the sole inventor of the wet collodion process pretty much as it now stands—not omitting even the dose of bromide to the collodion.

* This is the article previousl quoted.

From my museum of old photographic books I could give some more published information on this subject; but I can see no necessity for saying more than I have done at present. If Mr. Sutton has published details which I do not possess—and I doubt much whether he has—he would be conferring a boon on us old enthusiasts if they were collated and republished to the world in the pages of this Journal as a permanent record of (let us say) a settled question either in favour of Bingham, Archer, or somebody else.

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## FOREIGN NOTES AND NEWS.

DR. BORLINETTO'S EXPERIMENTS WITH ANILINE COLOURS EXPOSED TO LIGHT.—M. QUIQUEREZ'S NEGATIVE PROCESS WITH SHEETS OF COLLODION LEATHER.—HIS OSCILLATING DEVELOPING STAND.—YELLOW SPOTS ON PRINTS.—PYROXYLINE AS AN EXPLOSIVE.—PHOTOGRAPHIC ADVENTURES IN AFRICA.

DR. Borlinetto, of Padua, at the conclusion of an interesting practical paper on the effect of light upon some of the aniline colours—the substance of which we will give presently—concludes with a remark in which, probably, many of our readers will agree, viz., that failures in photography do not always proceed from impurities of chemicals or bad manipulation, but from influences at work in nature of which we know nothing, and which are beyond human control. But, unless our memory strangely deceives us, this observation of the learned Italian is by no means new; for we have ourselves heard remarks made in the studios of photographers who have been in trouble with their plates, attributing their mishaps to an adverse influence, which was certainly not of celestial origin. Then, again, Dr. Richardson—of local anæsthesia celebrity—has demonstrated to the satisfaction of many that every human being is surrounded, to the distance of a few inches from his body, by a sort of nerve atmosphere, which may produce most extraordinary effects. For instance: Lord Lindsay—who has gone out to the Mauritius, on an expedition, organised at his own expense, to observe the transit of Venus—once certified to his having seen Mr. Home float about in the air in defiance of the laws of gravity; whilst Mr. William Crookes, F.R.S., whose name is familiar to the older readers of this Journal as one of its early editors, has lately published a pamphlet in which some remarkable experiments made by him with the same Mr. Home are described. We have also had stories in this Journal of spirit photographs and unaccountable photographic phenomena. So, perhaps, the Italian *savant* may be right when he tells us never to show our albumenised paper to the light. Something like the advice of the Great Frederick to his brigadiers—to put their trust in Providence, but keep their powder dry—may be applicable to photographers, who are recommended to keep all their preparations and appliances in the dark, for who can tell what may happen to them in the light? Remember what Niepce de St. Victor once found out!

But to return to the experiments of the learned Dr. Borlinetto upon the aniline colours. He took sheets of paper—some sized with starch, some with gelatine, and some albumenised—and, having immersed them in alcoholic solutions of certain aniline colours, exposed them to sunshine for a few hours. The results obtained were as follow:—When aniline blue—but more especially Hoffman's blue—was employed the starch-sized paper changed colour in the light, and the others less so, all three seeming to lose vivacity. Two different kinds of fuchsine led to similar results; so also did aniline green and picric acid. But the colour—happily named, as it appears—which proved the most sensitive of all, and gave the strongest image under a negative, was that called "Bismarck." It was even found possible to fix the image thus obtained—in some degree at least—with a solution of protosulphate of iron containing a little alcohol. A very distinct transparent positive was got by adding some alcoholic solution of Bismarck to plain collodion, coating a plate with it, exposing it under a negative when dry, and fixing the image with the iron salt. Similar experiments to these have been described by M. Kallab, and similar results obtained. Unfortunately, the sensitiveness of these colours is small when compared with that of the salts of silver. Both experimentalists point out the fact that the nature of the organic matter in the paper has a marked influence on the result, vegetable matters imparting the least permanence, and animal matters the most, to the image obtained. Allusion is then made to the discovery of Niepce de St. Victor—which, however, has not been confirmed by general observation—that sheets of paper which have been exposed to sunshine act differently when treated with nitrate of silver from papers which have been kept in the dark; and this remark led our author to the kind of philosophising to which we have alluded in our first paragraph, and the practical deductions therefrom.

A gentleman who rejoices in the name of Quiquerez—our readers should not forget it, for we may have to refer to him again, as he is evidently a man of enlarged views and the right aspirations—has been busying himself lately with various schemes for simplifying out-of-door operations in photography, by finding a good substitute for glass plates, and he suggests the following mode of procedure:—

Take a sheet of collodion leather, sponge it with water, then float it upon bromo-iodised albumen, and hang it up to dry. When dry excite it by flotation upon a bath of aceto-nitrate, wash it well, and, whilst still damp, attach it by the edges to a sheet of cardboard. When dry it will be strained quite flat. In this state it may be exposed in one of Marion's convenient paper slides. To develope the image it must be cut off the cardboard and immersed in a solution of gallic acid, to which a few drops of aceto-nitrate of silver are added. It must then be fixed with hyposulphite of soda, washed, and dried. It can be preserved in a portfolio, and may be used in printing with either side in contact with the sensitive paper or carbon tissue.

The same gentleman also suggests the use of an oscillating developing-stand, made by suspending a common pneumatic plate-holder, with the plate attached, to gymbals, like a ship's compass; or to support it upon an upright spike, which passes into the tube of the holder, and is fixed to a heavy stand.

M. Davanne—one of the most practical of the French brotherhood—has been investigating for some months past the cause of yellow spots in prints, having been driven thereto by the purchase of a ream of albumenised paper every sheet of which seems to have given him an abundant crop for the purpose of experiment. It must always be a consolation to reflect that when one gets a bad sample of paper it may be turned to account in this way for the public good. Well, his researches seem to have proved what we always thought extremely probable, viz., that the yellow spots proceed from metallic particles in the paper, which exist for the most part upon the back, and arise from the mode of making, drying, or glazing the sheets. They do not appear to be present in the material of the paper itself until after it has been put into the sieve, and passed under cylinders, &c. The metallic spots may be either of brass, iron, or zinc.

The discussion was raised at a recent meeting of the Berlin Photographic Society as to whether or not the post-office in Germany is justified in prohibiting, as it had done, the transport of gun-cotton and ether by post. Dr. Vogel complained that this was proving a great hardship to small photographers in the country, and that the alarm about these substances was much exaggerated. Gun-cotton was not self-explosive in his experience, and ether was not a whit more dangerous than *eau de Cologne*, which was permitted to go unchallenged. Besides, the pyroxyline of the photographer was not the same in all respects as the explosive gun-cotton used in blasting or in war. In his opinion there was a grievance, and it ought to be altered. We are not aware what the law is in this country, but take it that neither ether, *eau de Cologne*, nor gun-cotton would be permitted to pass through the post, were it known to the servants what they were, but that such substances go unchallenged continually is certain. Officials in this country, however, are not so well drilled as in Prussia, nor is supervision so keen. We cannot agree, however, with Dr. Vogel, for these substances are dangerous, and should hardly be admissible amongst letters and papers which may possibly be of great value.

The substance of a very interesting communication from Dr. Hildebrand, the African traveller, who has recently returned from an expedition in that continent, was read at the same meeting. In the course of his observations Dr. Hildebrand stated that he had learnt dry-plate photography from Dr. Vogel, being anxious to dispense during his journeys with the trouble, toil, and exertion of a wet field process. He found, however, that the dry process would not work in his hands; so, "willy nilly," he had to go back to the wet. The object of his journey was in a great measure to obtain records of unvisited regions, and to get pictures of new races and of strange scenery. He began his observations, therefore, where civilisation ended, and took some very shrewd means of avoiding the usual slaughter which crowns the career of those travellers who venture into Central Africa. Amongst others he coated every metallic thing that shone—such as lenses, brass mountings, and what not—with a coating of dirty brown paint, well remembering that to the savage all is gold that glitters, and that by seeming to have nothing with him worth stealing he would be more likely to go scathless. He clad himself soberly, and his following was worthy of Falstaff's ragged regiment, for, as the old rhyme says—"De'il a ane a sark had on."

Dr. Hildebrand started in 1872, and went by Trieste, Alexandria, and Suez to Jiddah, on the Red Sea. Here he fell in with crowds of pilgrims, who had gathered from all quarters, *en route* for Mecca, and made his first acquaintance with the more prominent aspect of Mahommedanism. Thence he gradually moved inland until he reached in time the region of the purely savage, amongst whom—a no light matter—he meant to live. At Jiddah he saw the grave of Eve. It was about fifty metres long, so that "our first mother" must have been a woman of weight and size, if the lady, indeed, lie there. The place where the head is supposed to lie is covered by a mosque, and another stands on the place beneath which the bosom lies, while a pair of walls mark the spot where the legs are at rest. Mahommedans seek burial here, but that is a rather costly favour. It pays, however, in their estimation, for those who get within the sacred precincts have a straight and easy passage to "den Himmel." Eve's misbegotten son, Cain, found his grave in Aden—by no means a cool spot, but one whose wild surroundings well fit it for being the burial place of a malefactor.

The explorer made several excursions from Jiddah into the interior of Arabia, but was not able to do any photographing there. For one thing his apparatus had been forwarded to Aden, and for another the verses in the Koran forbidding the making of pictures and the like made any attempt rather dangerous. He, however, made a water-colour with his revolver beside him, and had the satisfaction to find that the natives respected that more than the religious passage. After this display of the warlike force he possessed it is hardly to be wondered at, however, that Dr. Hildebrand found none of the boasted hospitality of the Mussulmans displayed towards himself. This *gastfreundschaft* is not done by such means. From Jiddah the traveller went to Aden, that "devil's punch bowl," as Englishmen call it. Thence he went to Massowa, where he fell in with a Swiss officer in the Egyptian service, Munzinger Pasha, who invited him to bear him company in a tour through Abyssinia. He went, and again without his photographic apparatus, thinking the tour would be an affair of days, but it took up ten months, and it was not till the end of 1872 that he got back to Massowa. Then he took ship, intending to go back to Aden, but the wind was contrary, and he had to turn back to Africa, condemned to wandering through a portion of it on foot. Wandering thus through the neighbourhood of Donakisl he came upon an active smoke-emitting volcano, the only one as yet known in Africa, and, of course, he bemoaned his fate that he had not his photographic apparatus with him. Hitherto the traveller has done nothing in that way, and, save for his lamentations, might have been better without the burden of so much photographic potentiality "stored up at Aden."

However, he got away from this country at last and back to Aden, from whence he sailed for the land of the Somali, on the north-eastern shoulder of the continent. The aborigines in these parts are a very "queersome" kind of people. Of the last seventeen travellers who had ventured amongst them sixteen had been killed, and Dr. Hildebrand alone of all the band has come back safe. The Sultan of Berbera, whither he wandered, was very friendly towards him, and appointed two of his many sons to act as his protectors while he was in the country; but the traveller soon found that if they protected him it was for what he had, and with the arrangement that when he died they should amicably share his baggage. In order, therefore, to protect himself from his enemies—and friends—he constructed in the night time round his own quarters and those of his servants as well a sort of thorn barricade; but this was hardly an absolute means of security, and to ensure greater safety still he thought it well to work upon the superstitious feelings of the natives. He thought he "owed them one" for the many troubles they had caused him. The means he employed were, however, of a sufficiently innocent and jocular character. He gathered the people together, and when solemn silence had been obtained put secretly a thread round all his strong enclosures and attached the end of it to the trigger of his gun, so that should the enclosure be broken in upon at any point the gun would go off. While this was doing he sang a specially loud invocation—the *Wacht Am Rhein*, he believes it was—and then in a loud voice called to the bystanders:—"Listen, behold, and be astonished! Beware all of you of venturing near this cord, for whosoever dares to touch it falls dead. When it is struck this gun goes off and shoots anyone, without distinction, instantly dead. Me only the gun cannot hurt, for I know the art of preventing all firearms from touching me." Then, having loaded the gun with powder only, without either bullet or wadding, Dr. Hildebrand approached the string and pulled it, when a stream of fire and smoke issued from the weapon while he stood unhurt. This "hocus-pocus" had a marvellous effect. Nobody dared venture near the thorny hedge after that. The only chance for a traveller in these

regions is, in his opinion, to get the people to esteem him a devil charmer, a wonder worker—a great "medicine man," in short. But for the present we must leave this traveller, whose gossip is interesting, although the photographic part is long in coming. It will come though, let us hope, before the end.

## SIXTH CONVENTION OF THE NATIONAL PHOTOGRAPHIC ASSOCIATION OF THE UNITED STATES.

It will be remembered that, shortly after the last meeting of this Association, we published such an abstract of the proceedings as we could obtain from a complete file of the various Chicago papers of the week during which the meeting was held, and promised at some future date a detailed account of that which we then presented in outline. Owing to the publication of the official report, of which we have just received a copy, we are able to redeem our promise sooner than we at one time anticipated, and this we do by way of supplement to our former notice, which contained the leading features of a business nature, but was defective in those technical matters which prove most interesting to photographic readers.

On Lighting and Retouching.—Mr. Bowdish delivered the following address:—

You recollect that about six years ago every photographer in the country had his camera in a groove, and moved it in a certain direction on the floor. Every face that he took must be in a certain position, and have the light upon it from a certain point, and every hand must be crossed in this position; that was the old accepted idea. A few years after that the Rembrandt came up. We all have a disposition to rush off at a tangent, and go to certain extremes. The Rembrandt was an extreme. Some needy gentlemen made a reputation upon it probably by accident. It was a good idea, however, and gave us the notion that there was some other position than the fixed one upon the floor. It gave us another idea—that there was almost no limit to the position in which we could place the subject. Our first duty is to study the subject and the face. There is no face that has not pleasing positions; you can select the best lines by studying it, and while studying it we should take time to do it, and after we have studied it we should place our camera in the proper position to get the best effect of the light. As I said before, the Rembrandt gave us the idea that we could get out of this groove; since that time photography has advanced more than it ever did before.

There is another idea in regard to retouching. The next thing that comes up new in photography is a retouched negative. The first negatives that were retouched were a secret. I saw some of them; they were imported into this country. I pronounced them retouched at once. In the same way you recollect were M. Salomon's pictures. I saw the first of them after being brought to this country, and would you believe, when I said that they were retouched in some way it was denied. The owner said he saw the negatives; they were printed on albumenised paper. There was no evidence of retouching; consequently the idea was that the pictures had not been retouched. A short time after that we found that negatives began to be retouched, the secret leaked out, and since that time photographers have gone to another extreme, and that is in retouching the negative too much. Now this is a serious matter. We know that there is a false taste amongst people in this country. If they have got wrinkles and freckles or anything of that kind they must be done away with, and photographers use any way to get their money. They humour these things, and do this too much. I used to make the best possible negative. If one be not right make another; if the negative be too intense make another; if it be too thin make another; if it be under-exposed or over-developed make another; but after the negative is properly made it requires an artist to retouch it. For instance, I have seen negatives spoiled. Almost every person has a shadow under the eye; they may have some wrinkles in the forehead. I have seen pictures where the cheek looked as if it was swollen or rolled up to the eye; on the other side of the face it was a mass of black shadow. Now that is not artistic. On the other hand, we will find a negative that is intense in spots. It is lighted too much all over the face, and there is not a gradation of light and shade, which certainly should go to make up a negative; but it is almost all white, and then it is retouched white and printed white. There are no wrinkles in it; there is no expression in it; there is no modulation in it; consequently, if it be of a person who has got a few freckles and wrinkles, it pleases him, and the photographer gets his money. You will find all over the country that negatives are retouched to death.

Now I do not know that my remarks are at all edifying; but this is the first time that I have had an opportunity to express my views. Perhaps they are views you have heard expressed time and time again, through the journals and otherwise; but we should all understand, and we should make one point, and that is to educate the people as to what is artistic and right. We ought not to spoil our beautiful art by yielding to the prejudices of the people, in order to do away with freckles and wrinkles, and everything of that kind, and destroy our art, as it car ainly is tending in that direction today. These are the points:—1. Make a good negative. 2. Do not spoil the negative by retouching, and we have got a better thing then than we would have by doing either of the others or both together.

On the Art of Taking Good Photographs.—Mr. W. M. Lockwood, in response to an invitation from the chair, spoke as follows:—

If there be any secret in making a good picture it is in knowing the entire manipulation. I become satisfied every day of my life, as I investigate pictures, that we know very little about the technicalities of the art. It is a great thing to know a process, to go through a process, and make a good picture. It is a greater thing to understand all the little technicalities by which a good picture is produced.

There are no two circumstances, so far as individual circumstances are concerned; that is, no two persons make equally good pictures under the same circumstances. I am satisfied every different application makes a different chemical effect. Unless the man be a first-class chemist, and understands the relation of chemistry to light, he will fail in many respects to make a good picture. You must be superior to philosophy in chemistry, so far as belonging to photography.

Another thing: a man must be a good optician. It is almost impossible to make a good photograph unless you understand the science of optics thoroughly. You may do it once in a while. You must understand optics. There is another point: after you have studied your science of chemistry and of optics, unless you understand the science of light and its electrical force, together with this chemical force, you will fail in making good pictures. As I have looked over this science year after year these things have come to me gradually by hard study. I begin to think today that I know nothing about photography; that we are simply at the beginning. We are germinating. So far as the real science is concerned we know nothing of it. When we shall be superior to the chemistry of photography, supported by the science of optics; when we shall be superior to the science of light in photography, and its application to photography, we can begin then to think of taking good pictures. And we have been satisfied in being illiterate, in not understanding our business, in not studying our business. The great trouble has been lack of study—lack of effort. Those who have seen total failures, so far as the art is concerned, answer for those who have never studied or got the key to the art. Those who expect to flourish by your art have got to make up your minds to it today, if you have never understood it before; that it is based on three or four known sciences; that a physician who diagnoses a disease from one temperament would not diagnose the same way from another temperament; and that a photographer who makes good photographs would not light one face as he does another, if he wishes to express good individuality. I say, if you wish to be good photographers you have to understand the basic principle which governs the science of photography. In saying that I say a great deal. I do not know that there is any need of my telling my process, because we work different processes, because we are different persons. Although one man may work one process well, it does not follow that another man can work that process equally well. But he can by great tact and much study, by studying the works of our neighbours from Maine to California, by being liberal in his sentiments, and by listening as well to those who know little of the business as to those who are well cultured. In the business of all we get many new thoughts that help us towards the final triumph; and it is by these little acquisitions time after time, steadily holding to all that we get, by trying to develope new powers, by being inventors in every branch of science, do we make real progress, and in every way feeling that photography is a real, actual science, and not some black art or some legerdemain. We must all appreciate that we are only students in the photographic art; and if we do not seem to make progress in three months, then work on for three years, steadily trying to do our best, and we shall succeed. As to students, I have given over the idea of taking students. I have tried that for twenty years, and I believe I have made a first-class failure every time. If anyone wish to learn the art, and see fit to study with me a series of years, I will do the best for him I can, provided he does his best. In trying to make people believe that they could learn the art we have made a great many poor photographers, who make so many poor photographs; and it is from this great need of an understanding of the technicalities, and from a want of consideration of the climate, the weather, the light, under every consideration of optics and chemistry, that we are able to make good photographs.

Mr. Rulofson (the present President), on the subject of Mr. Lockwood's address, said:—

There is nothing we need so much as cultivation, education, and elevation. We need it more than we need money. Still I promised to talk about money. One of the ways that I would suggest to photographers to make money was not particularly to learn to make photographs cheap, but to learn to make a great many of them in a very short time. By this means they would be enabled to offer great inducements to book publishers, and publishers of monthlies and literary journals, when they had a theme to discuss that it was possible to illustrate with a photograph. I would recommend every photographer, on his own account—week-days if possible, Sundays if you must—to make

a dozen negatives, give them these prints for nothing, if they will furnish you two lines of printed matter under it. The next thing that will happen, they will come to you and offer you twelve dollars for half a hundred of those pictures. That is one way in which we have endeavoured to make money. It has been eminently successful—so much so that there are three journals published in San Francisco now always illustrated; sometimes they have two, sometimes they have as many as three, photographs from our establishment in each number. Now, you see, that produces a vast amount of business for us.

Another method we recommend photographers to adopt with reference to making money. Whilst I believe in slinging ink, there is not a man that rolls the roller over the type, who comes to make a proposition to advertise, but what I say—"All right, my boy, you can advertise just as much as you please, provided you let me pay you for it with the labour of my hands." "How can I do that?" "I will tell you. Uncle Sam has made me the authorised agent of a certain kind of money; that looks very much like a hundred-dollar gold note. That is a fifty-dollar gold note; that is a hundred-dollar gold note; well, that is not." I say to the young man—"You can go on and advertise me as much as you wish. Present that to my clerks; they are instructed to receive that the same as gold." I issue between five and ten thousand dollars' worth of this money every year in payment of advertising; the printer slings the ink. He makes his business flourish, he pays his men, they patronise me, and we are all rich. It is just as good to them, and it is just as good to me.

There is one thing I will take occasion to say in conclusion, for, though I attend this Convention but rarely, yet it is endeared to me. I keep all the photographic publications that I can get my hands upon. I keep them constantly on my centre-table. I am proud to know there is a literature belonging especially to our beautiful art.

I am glad to look back and see the progress that has been made. I can remember when my kit could be packed in my trunk; but those days have gone by and are lost in the distance, and I am permitted to aspire to a position amongst men of commerce, and amongst men of sense, and amongst men of uprightness. How has this been accomplished—by my individual efforts? By no manner of means. I have always sought the humblest labourers, the humblest co-workers in this direction, taken them in hand, and shared with them whatever prosperity I have had. I have looked up to those above me, and said—"Reach down here and give me a helping hand." That is what I recommend to all of you. I pledge my sacred honour, always, as long as reason is on its throne, to occupy that same position.

*(To be concluded in our next.)*

## OUR CLUB.—HOW WE TOOK FORT GEORGE.

"Come on, boys. Gather round! gather round!" exclaimed Ned Young as we stood round the club fire on the last meeting night of the season.

You must know Our Club was a photographic club, and, I believe, in many respects an example to societies and associations of much more pretension. There were only some seven or eight of us, and we met once a fortnight to have a little social and business intercourse. We had no mystery, no patent, and no new processes sent from the gods. We had a few "tips" and wrinkles sometimes; these we freely gave and freely took, and jogged along in peace with each other. Ned Young was an artist of no mean standing. He stood six feet two without his boots, and was one that did not believe in any of your "hanky-panky" improvements. Two men came to him with a new artistic process, and after showing him what it could do, he quietly asked them "to wander wi' it to a more congenial soil!" and, after a little more pressure, he exclaimed—"Sir! own ye want to sell me; but it 'ill no be this mornin'!" Next to Ned Young sat Old Atlison. He was a composition of guttural sounds and snuff. When he spoke you could never tell what he said, for there was the sound of the up-draw of a small spade full of snuff as an accompaniment to every speech, which to a stranger rendered it quite incomprehensible. The "taddy" lay thick as a peat-bog on his upper lip, and it was no sneezing matter to have the washing of his shirts.

Brown, the "bones" in the amateur nigger minstrels of the town, was with us. He used to dance a prize jig, and wore a prize belt that he had got the tinsmith to make for him for ten shillings.

Will Ranken sat next to Brown. He was an artist in the true sense of the word. He was always talking of "pose," "repose," and "suppose." He would take an hour to arrange a sitter, all the time dreaming of going to Rome. "Oh! St. Peter's!" he would invariably exclaim, "how long is this to last?" and so also thought the sitter.

Dawson was there. He was an engraver to his trade, and dabbled a little in the art. And wee Tam Cook. He was so little that he had to use a stool to get up to the focussing-glass; and he looked for all the world like a monkey playing at taking pictures.

This was the company all told, and we drew in our chairs a little nearer to the fire, as Ned Young started to tell us how he took Fort George.

"You see, lads, the soldiers had only four days to stay, and consequently there was a rush for pictures in the camp. Joe Russell and I were on the ground, but they saw no chance of our getting through all the work, and so they telegraphed to M'Pherson, at Inverness, to come down for a couple of days. He had taken a picture of the stag the Prince had killed at Ross Castle, and had got his name up. Joe and I, you see, were a travelling company—share and share alike; and, having sent on to Glasgow two days before for five hundred ferrotype plates quarter size, it would have been death to our prospects to have M'Pherson come.

"After a short consultation, Joe said—'Well, Ned, I'll go on the way and keep him back.'

"'All right!' I exclaimed. 'You go and meet the enemy, and I'll subdue the Fort.'

"Joe was a gentlemanly-looking fellow, and up to any amount of dodges, so I wasn't afraid of his success. We parted, and I started work, toiling on from morning till night. I knocked off about fifty pictures. Joe never turned up, and I repeated the same next day. M'Pherson had sent no reply, nor put in an appearance. At the end of the third day I had so brushed up the work that if he came he would have little or nothing to do; so with a heavy pocket and a light heart I went home to count our gains.

"Whilst I was in the midst of this pleasant occupation Joe opened the door, walked in, threw his hat upon the bed, and, drawing in a chair, sat down by the fire, saying—'Well, Ned; you have had it all your own way, and a pretty good haul, judging by the pile.'

"'Oh! lashings, Joe; but what about M'Pherson?

"'I didn't kill him, Ned,' he said with a laugh, 'so you can put p your frightened looks.' Then he continued:—'Fact is, I got dressed in my best, and, putting on my military air, and taking my little cane in hand, I sallied forth to meet the enemy. As I trudged along the road I went on developing schemes like plates, but they were all under-exposures and useless. I was a few miles from the Fort when I espied our bold M'Pherson bearing down upon me with his pony trap; so I waited till he came up, and then I saluted him, putting on a grand disc. "Mr. M'Pherson, I believe," I said. "Yes, sir," he replied; "I'm on my way to the Fort." I saw that I had made an impression; he took me for a captain at least. "That is the reason that I am here. As the soldiers got orders to march out this morning, Captain Ewing asked me to meet you and to apologise for him; and, at the same time, he wanted me to show you some trees and little bits on his estate that he wants taken, and by this means save your time."

"'That was a deep cut, Joe; did he drop?'

"'Like a bird! We travelled back to Jim Strong's house, where they entertain man and beast—that was myself and the M'Pherson. My friend believes in good whiskey, and so I let him have it till he was pretty well primed, and then I took him out to see the trees that the captain wanted photographed before the foliage was too dense. After wandering with him round some fields of cattle, belonging to goodness knows who, and pointing out all the big houses within sight as being likely to want pictures, I am sure that the order I gave M'Pherson could not possibly be short of £150, and so he returned very happy but very weary to Strong's at night. Next day we got up early, and drove over to Ewing's shooting-box, and I showed him the various points the captain wanted it taken from, and some other of the views about. I was not particular to a pound or two. I had lots of the real mountain dew, and M'Pherson enjoyed it before leaving the hotel in the morning. I left a letter addressed to myself to be delivered on my return.

"'In the midst of the old Scotch songs and whiskey that M'Pherson was indulging in at night the letter was sent in to me. Having written it I knew all about it, and so could read it to my friend without any mistake, which I did:—"As the regiment leaves here for the south tomorrow will you be so good as let Mr. M'Pherson know, as it would be quite useless his coming on here now. I enclose a sovereign to pay his expenses." So I handed him the coin and he looked proud as an emperor. That night he showed his affection for me by trying to embrace me several times, swearing that he loved me, and that I was more than a brother to him. At last he sank upon his downy couch in sweet repose.

"'I saw him safely on his homeward way next morning, and as he jogged along I could see him calculating on the side of his cart with a piece of chalk how much the jobs he wouldn't do next week would come to.'

"And so, boys, that's how Joe and I made £30, and took Fort George." MARK OUTE.

## Correspondence.

### PORTRAITS AND MEMOIRS OF PHOTOGRAPHIC "FATHERS."—VISIT TO M. HUTINET'S MANUFACTORY.

I SEE it is the intention of the conductors of THE BRITISH JOURNAL OF PHOTOGRAPHY to give the portraits and biographies of men who have become eminent in photography. It is an excellent idea, and one which I think will render great service, please the general reader, excite emulation, and, perhaps, be the means of preventing discouragement in those who have not yet succeeded, but who continue to persevere notwithstanding previous failures. It will give them courage when they read what difficulties were overcome by the perseverance of those who have preceded them. In my humble opinion, not only inventors must have a word to stimulate them to new exertions, but we must

not forget the more humble class—those men who, as it were, remain in the background, rising early and working late, their brains always in a fever of excitement seeking after something new, and very rarely catching "the bubble reputation," the public thinking them well paid if they, perchance, gain a fortune, but covering them with sarcasm if they lose one.

To speak of the manufacturer: let us look back only a few years. How difficult it was to procure a good lens; a convenient camera was out of the question; it was almost an impossibility to obtain good paper; and ornamental Bristol cardboard was not to be thought of! The progress that has been made up to the present day would have surpsssed the most sanguine hopes of the patriarchs of photography. Good lenses can now be had without difficulty; beautifully-constructed cameras obtained; and paper, which has been the object of so much discussion, is, without doubt, much better than formerly. But it is in photographic mounts that visible progress has been made. Who cannot remember the time when plain cardboard, roughly squared up with a pair of scissors for *cartes de visite*, was employed? Put this in comparison with the rich and artistic mounts now made! A photographer of 1875 would think himself dishonoured if he did not give his customer a highly-finished, artistic mount, decorated even on the back with his name and address, sometimes, in chromolithography.

I was recently enabled to judge of the extension of this branch of photographic business and admire the variety of form of this article; for I made a visit the other day to the well-known manufactory of M. Dauvois, now in possession of his successor, M. Hutinet, in the hope that, peradventure, I might see and learn something that would be interesting to the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY, and, at the same time, gather a little information as to the work which was being carried on, and also examine whether the fading of the proofs is to be attributed, in a great measure (as some writers affirm), to the cardboard or to the bronze powder employed in the ornamentation. I chose the manufactory of M. Hutinet, as that is, without doubt, the largest and best house in Paris for the manufacture of photographic mounts.

It is, in a great measure, to the indefatigable efforts of M. Dauvois that we are indebted for the progress made in that article. He established his manufactory in 1847, and eight years afterwards he began to work in connection with photography. At this period he delivered to his customers large sheets of Bristol cardboard through which were drawn parallel lines to show where the proof was to be pasted and the scissors to pass. Afterwards he delivered the same description of cardboard with the name and address on the back, which was then thought an extravagance by many. At last he believed it would be more convenient to deliver the Bristol boards cut into proper size. He then began to feel his way in order to ascertain whether or not the public would "take" to decorated cardboards. He sent out specimens of his Bristol boards with india tint, and these being very well received the road to fame was full in view.

In 1867 M. Dauvois retired from business, and M. Hutinet took the direction of the establishment. This gentleman ordered new machines from England, among which were those for cutting out cards with round corners. I saw four of these machines at work. The cardboard is placed under the frame; the punch or punches descend and cut out twenty cards at a time, which fall into separate boxes ready to receive them. A printed sheet of Bristol board is so placed that the machine draws it under revolving discs, which cut it square ready for packing.

It appears wonderful, when we contemplate the *bien-être* the invention and extension of photography have brought to the homes of numerous families. In this manufactory a large number of persons of both sexes are employed, who thus gain a comfortable livelihood.

The *carte-de-visite* has to pass through many hands ere it is ready to receive the print.

1. Thin sheets of paper are covered with flour paste and joined together in order to form the cardboard. I embraced the opportunity of asking M. Hutinet if the cause of prints fading was not to be attributed to the fermentation of the paste employed. He replied that he did not believe so, for two very simple reasons:—First, because it would be quite impossible to employ old paste; secondly, that he had delivered mounts made from the same batch to several houses, both home and foreign, and, while one house had complained, all the others had expressed their satisfaction with the goods.

2. The wet paper is placed under powerful hydraulic presses.

3. A thin layer of stucco is then spread over the surface and dried.

4. The Bristol board is now placed under heavy iron rollers to equalise the thickness.

5. The sheet of cardboard is now laid upon a flat table, and a large brush charged with soap-powder dust is passed over its surface in order to polish it.

6. The lithographic machine then goes to work to print the name, address, &c., in colours or in gold. With reference to this branch of the operation I had a long conversation with M. Hutinet as to the supposed destructive qualities of bronze powder. He said he was aware of the inconvenience attending its use, and he sincerely wished that his customers would permit him to suppress that disagreeable operation. As for myself, I pitied the poor women employed at that work; they had the appearance of copper-coloured Indians. I suggested that it would be better to do that work in a separate room, and not to impregnate other cardboard with the pernicious dust. M. Hutinet said that for the future it should be so done.

7. The Bristol board has now to be glazed.

8. The board is then put under the cutting machine, which cuts twenty cards at each stroke.

9. The cards cut are placed in packets, the edges being stained and polished.

10. The decoration is now carried out, and is mostly done by women.

11. All the finished boards then pass through the hands of the manager, who separates the good from the bad.

12. The last operation is the making up of the cards for market.

The large number of persons employed all look cheerful and contented—a state of things which speaks highly in praise of their employer, M. Hutinet, to whom, in fact, great honour is due, not only for having pursued the path trodden by his successful predecessor, but for having made his manufactory what it is at the present day—one of the best in France.

This establishment (so the manager informed me) manufacture a million of *cartes de visite* daily; and if cabinet portraits, Victoria cards, and India-tinted Bristol boards were included, the number would reach more than three millions. I am happy indeed to "give honour where honour is due." E. STEBBING, *Prof.*

3, *Place Bréda, Paris, January* 5, 1875.

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## "THE NEW LENS."

*To the* EDITORS.

GENTLEMEN,—As promised in our letter to you of December 16th, 1874, we now have the pleasure of sending you herewith Messrs. Steinheil's answer to Mr. Dallmeyer's claim on their new patent aplanatic portrait lens.

We think that you and your readers, upon perusing the same, will at once agree that Messrs. Steinheil have simply stated facts in their reply, which must carry sufficient weight in the minds of everyone to prove both now and hereafter (whatever the next step may be) that Mr. Dallmeyer's uncalled-for attack was most unwarrantable, and one which we are advised we can hold him legally responsible for. We feel this much more than may be at first imagined, as we so well remember, and Mr. Dallmeyer must too, the lengthy correspondence which took place some years since, when a similar claim was laid by him to the right of invention respecting the lens now so well known as the "Steinheil patent aplanatic doublet."

We may add that our respect for our foreign friends is far greater than ever, as they might have alluded to this in very severe terms, but have refrained from doing so.

Fearing the correspondence upon this subject has already taken up too much of your valuable space, we will, therefore, conclude by hoping that the particulars given will be sufficient, and that photographers themselves may reap some benefit by the introduction of the new lens. —We are, yours, &c., MURRAY AND HEATH.

69, *Jermyn-street, London, S. W.*,
*January* 4, 1875.

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*To the* EDITORS.

GENTLEMEN,—In No. 761 of THE BRITISH JOURNAL OF PHOTOGRAPHY, December 4, 1874, Mr. Dallmeyer attacks the patent taken out by us for the form of a new construction, exactly given, of an aplanatic portrait lens, and supports his claim by his patents of September 27, 1866, and March 21, 1867.

In these patents, which we have now before us, Mr. Dallmeyer lays particular stress on his having invented the arrangement of the glasses, so that outer lenses consist of the stronger refracting medium and the inner ones of the weaker one.

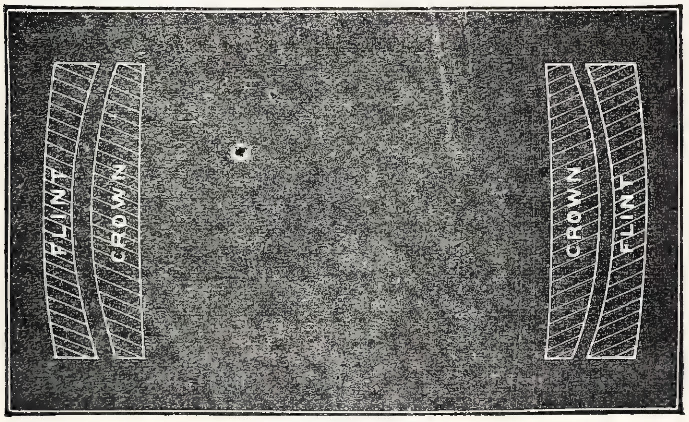
This assertion is contradicted by the communication of Mr. F. H. Wenham, in No. 762 and No. 764, December 11 and 25, 1874, of your Journal, regarding Mr. Grubb's aplanatic lens, for which he took out a patent in the year 1857. But we have also employed and *published* sooner than Mr. Dallmeyer this arrangement of the different

sorts of glass without having known anything of Mr. Grubb's patent (which is very excusable for foreigners); for on the 19th of January, 1865, we took out a Bavarian patent for object-glasses, in which the first and last lenses consist of flint glass, and the second and third of crown glass. There are two articles on this subject in the *Nachrichten von der Königl Gesellschaft der Wissenschaften und der G. A. Universität zu Göttingen:* I. Heft, No. 6, 8 Marz, 1865:—*The Conditions of the Production of Correct Dioptrical Images by Systems of Lenses of Considerable Size*, by Dr. C. A. Steinheil and his son, Dr. H. A. Steinheil. II. Heft, No. 8, 19 April, 1865: Supplement to the preceding article, in which the following passage occurs:—"We have now carried out the calculation with five numbers of our four-fold object-glass to the twelfth condition of the coincidence of Gauss's two principal points, and found the following with the same species of glass:—

$$\text{Aperture} = 30'''; \text{ focal length} = 112'''$$

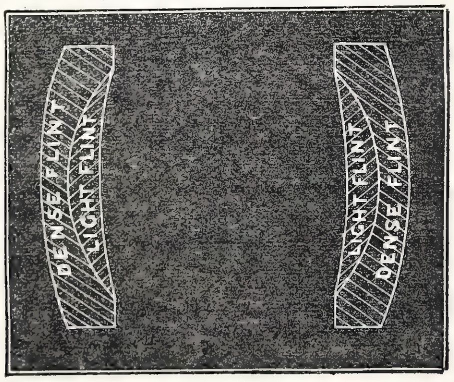
$$\text{Flint}\begin{cases} f = +110{\cdot}1 \\ g = -\ \ 43{\cdot}3 \\ \triangle = \ \ \ \ 2{\cdot}06 \end{cases} d = 3''' \qquad \text{Crown}\begin{cases} f'' = -302{\cdot}4 \\ g'' = +\ \ 45{\cdot}6 \\ \triangle'' = \ \ \ \ 2{\cdot}06 \end{cases} d'' = 5'''$$

$$\text{Crown}\begin{cases} f' = +\ \ 45{\cdot}6 \\ g' = -302{\cdot}4 \\ \triangle' = +\ \ 45{\cdot}0 \end{cases} d' = 5''' \qquad \text{Flint}\begin{cases} f''' = -\ \ 43{\cdot}3 \\ g''' = +110{\cdot}1 \end{cases} d''' = 3'''$$




HALF OF ACTUAL SIZE.

In the winter of 1865, and in the conviction that a better effect could be obtained by simpler means than those existing in the triple lens, we calculated our aplanatic view lens, consisting of two species of flint glass, and composed of two cemented achromatic combinations, in which the more strongly refracting flint lenses stand outwards. This




lens we sent abroad in July, 1866, and Dr. D. van Monckhoven affirms expressly in the Wiener *Photographische Correspondenz*, January, 1869, page 141, that he received in July, 1866, the first aplanatic symmetrical lens of flint glass from us.

By the above it is proved that Mr. Dallmeyer cannot lay any claim to the invention of the above arrangement of different species of glass. If this invention cannot be supported, nothing remains of Mr. Dallmeyer's patent of the 27th September, 1866, but his portrait lens, in which the first combination is cemented, the second is composed of two separate lenses—an apparatus which has frequently been made by him, and has raised his reputation considerably by its good effects.

Of his patent of the 21st March, 1867,* remains a view lens of one-fifteenth aperture, which consists of two cemented menisci of such radii as to render impossible the employment of an aperture of one third or one-fourth. The back combination being smaller than the foremost is not at all new, and without any importance in the construction.

Many opticians had already endeavoured to construct a portrait apparatus of two cemented lenses, but they had not succeeded till then in finding those forms of lenses which give the instrument that degree of perfection that could equal those in use. Among the very great number of possible forms with two cemented combinations we have found this proportion of radii by choosing the proportion which can be employed to produce the best results in respect to distinctness, clearness, plane of field, and correctness of drawing. These complex and difficult calculations have cost us the labour of five years.* The results of these calculations are *the proportions of the radii*, and our English patent is founded on them.

We willingly agree that Mr. Dallmeyer also tried to construct portrait apparatus with two cemented lenses; but, as he has not mentioned this construction in his catalogue, we presume that he has not attained that degree of perfection which is necessary at present for a good portrait apparatus.

If this had been the case with our new portrait lenses it would certainly have met the same fate as Mr. Dallmeyer's, and would have been forgotten; we do not, therefore, see any reason why Mr. Dallmeyer should object to the sale of our apparatus in England. If, however, our construction in the chief points is better than those that have preceded it the instrument is certainly new, and the improvement perfectly justifies us in taking out a patent.

As no good portrait combinations with two cemented lenses have appeared before it cannot be said that "we are too late in the field," as you, Gentlemen, in No. 761 of THE BRITISH JOURNAL OF PHOTOGRAPHY, have said; and he who cannot prove that he has discovered the same proportions of the radii by which we have obtained this effect cannot maintain that our patent is "an infringement of his rights."

We, therefore, send one of this new apparatus (twenty-seven lines aperture and seventy-nine lines real focal length†) to our representatives in London—Messrs. Murray and Heath, 69, Jermyn-street—for inspection.—We are, yours, &c., C. A. STEINHEIL SÖHNE.

*Munich, December* 30, 1874.

### *To the* EDITORS.

GENTLEMEN,—Mr. Dallmeyer should have paid more respect to the requirements of English law at the time that he obtained his patent, and avoided the risk of losing it by making untenable claims and attempting to grasp things previously known. He has since grown wiser.

The "authoritative opinion" that he has procured, considered as one for closing "discussion," seems ludicrous. The party who wrote it for public notice has about as much *authority* in the real issue as a man employed to paint the caution board of "trespassers beware" for debatable ground. The affidavit of patent agents is never required in court as exponents of the law.

My own opinion, of course, must be taken for what it may be thought worth. I do not, however, set it forth without frequent experience as a patentee—in one case as defendant in a long-litigated case which established my rights—an impressive way of learning the law.

The "authoritative opinion" might, perhaps, have been modified—at least, for Mr. Dallmeyer's *private* edification—if the candid information had been given that lenses of the form that he claims, viz., with the denser elements outside (as in Grubb's patent), had been made by different opticians long before the existence of his own; and Messrs. Steinheils' lenses have for years past been advertised and sold by their London agents, Messrs. Murray and Heath, exactly resembling the *patent* (?) "rectilinear" of Mr. Dallmeyer, whose futile attempt, by a threat of proceedings, to stop their sale proved that he did not lack the will to do so. I cannot pay such a poor compliment to his understanding as to say that he was not *then* aware that his claim was both insecure and unjustifiable.

I shall not imitate Mr. Dallmeyer by *calling names.* He states that I appear as a "confessed infringer," thus constituting himself sole judge and jury for the integrity of his patent; and next asserts that he will be "quite satisfied to accept the award of a tribunal which can give the force of the law to its decisions." I need scarcely say that I have made no such *confession*, but have openly declared a fair right to avail myself of long-known prior discoveries. I prefer that this expletive should stand endorsed alone by Mr. Dallmeyer as a distinguished mark worthy of the writer. In endeavouring to appropriate and monopolise ideas of value that have become the property of the community Mr. Dallmeyer's position in the question of a good or bad patent is a tangible, though equivocal, one; and, whether his course should be one either of action or inaction, time will equally determine its truth. I can assure him that there is no intention on the part of Messrs. Ross and Co. of discontinuing the manufacture of symmetrical lenses.

I do not court the honour of a "discussion" or correspondence with Mr. Dallmeyer, who is to me a stranger; but when he so complacently claims the "new lens" as his own property, and before even a solitary one has reached this country attempts to interdict its use—not by direct, private communication, but by the very unfair and unjustifiable medium of a letter of warning in a well-known public journal—he attracts criticism, and, as I am so circumstanced as to have a peculiar right to speak on this question, I take the privilege of making my comments, whether the letters of Mr. Dallmeyer contain any allusion to myself or not.—I am, yours, &c., F. H. WENHAM.

7, *Wigmore-street, Cavendish-square, January* 2, 1875.

* Our Bavarian patent for the aplanatic lens with one-seventh aperture is dated the 12th November, 186[illegible], and Mr Dallmeyer's patent is dated the 21st March, 1867.

* We are willing, if necessary, to lay before any English experts in Munich the calculations we have made.

† Two and three-eighths and seven inches English.

## LIFE-SIZE HEADS.

*To the* Editors.

Gentlemen,—Your *Notes* by a "Peripatetic Photographer" allude to a correspondence in a contemporary as to the taking of life-sized heads direct. He alludes to my claim as though I had claimed to have been the first to produce life-sized heads; and, pluming himself on the demolition of an "aërial castle," proceeds to point out that there were life-sized heads by foreigners in the Exhibition of 1862, and that some American photographer could say "significant words relative to the modern claims referred to."

Your correspondent has, however, done me an injustice, and has not read the correspondence he refers to with due care. It was said in your contemporary that, previous to Mr. Crawshay instituting his prizes, life-sized heads had never been exhibited in the Photographic Society's Exhibition.

I demurred to this statement, and pointed out that I exhibited some in 1870, three years before the first Crawshay competition.

This harmless claim of mine has been distorted and magnified; and, as I before said, an attempt has been to do an injustice to,—Yours, &c.,

H. Stuart Wortley.

*Patent Office Museum, South Kensington, London, S. W., January* 5, 1875.

[Colonel Wortley did not make a claim to be the *first* who took a life-size head direct; he merely said, in reply to a statement made—to the effect that Mr. Crawshay was the first—that he (Colonel Wortley) had been beforehand in that field. We find, however, on making due inquiry into the matter, that our "Peripatetic" correspondent was quite correct in saying that life-size direct portraits were exhibited in the foreign department of the International Exhibition of 1862, these having been duly entered and particularised in the official catalogue, a copy of which is now before us. In our contemporary's statement relative to life-size heads no reference was made to their display in "the Photographic Society's Exhibition."—Eds.]

## FADING OF PRINTS.

*To the* Editors.

Gentlemen,—I have just read the editorial remarks *On the Fading of Prints, and a Means of Removing from them the Last Trace of Hyposulphite of Soda.* Perhaps you will kindly allow me space to state one fact in connection with the means they advocate.

About a year ago I very carefully finished, by way of experiment, a few large pictures with nitrate of lead, as recommended, and mounted them with fresh-made starch on cardboards obtained from a respectable dealer; these pictures have been exposed to no extraordinary vicissitudes, and yet they have faded in spite of the lead treatment.

However, after reading the report of the American committee I printed a couple of pictures whole-sheet size, and finished them with lead as before; but this time I have subjected the cardboard also to the lead solution, so that if any hypo. were present it might be decomposed. I have used fresh-made starch as the mountant for one of the pictures, but intend to try gum arabic for the other.

In my first experiment German albumenised paper was used, but in my last English paper has been tried.—I am, yours, &c.,

*Great George-street, Leeds, January* 2, 1875. William Hanson.

## UNSUSPECTED CAUSE OF DETERIORATION OF GAS BAGS.

*To the* Editors.

Gentlemen,—A writer in the last number, under the above head, has discovered what I should have supposed was perfectly familiar to every owner of gas bags for the last dozen years, viz., that the cause of injury was the chlorine, which always passes over in more or less degree when potassium chlorate is used, and that this chlorine is only the indirect agent, &c. Nevertheless, if you get rid of the chlorine you save your bag, and the mode to do so is simply to pass the gas through about a pint—dipping the gas into, say, four inches of the fluid—of strong solution of caustic soda. This will remove every atom of chlorine, and the same solution will serve for two hundred cubic feet of gas.

I would also recommend, in making oxygen, that instead of using manganese di-oxide with the potassium chlorate to use common sand in about the same proportion. It is cheaper, cleaner, absolutely safe, and answers just as well.—I am, yours, &c.,

*Manchester, January* 4, 1875. Thomas Harrison, F.C.S.

## THE DISCOVERER OF THE COLLODION PROCESS.

*To the* Editors.

Gentlemen,—In your last issue appears a communication from Mr. Sutton attempting to reopen a question as to the priority of invention of the collodion process, which has long been settled. Mr. Sutton seems to have been acquainted with Mr. Bingham; but as to Mr. Scott Archer he says:—"I did not know Archer personally, never visited him in his *anctum*, never saw any of his productions, and never worked in his patent dark box. But what I have heard of him does not give me an exalted idea either of his scientific attainments or his practical sense." In plain English, Mr. Sutton knows nothing whatever about him except from hearsay. If one had not seen the words in print it would be scarcely credible that he, nevertheless, constitutes himself judge, jury, and witness, and proceeds to try and pass sentence of deprivation upon the man of whom his knowledge is so slight.

I *did* know Scott Archer; I *did* visit him in his *sanctum;* I worked scores of times in his patent dark box; and feel not the slightest doubt in the world that Scott Archer was, in truth, what everyone believes him to be, the real inventor of the collodion process.

So far was Mr. Archer from being merely an *aide-de-camp* or assistant to Mr. Bingham that he had the entire thing at his fingers' ends, and a completeness of knowledge on the process that was marvellous. He left us the collodion system so complete that many years elapsed during which the ablest chemists and mechanicians racked their brains in vain to make any substantial alteration in Scott Archer's process. It seems almost the act of a Nemesis to remind Mr. Sutton that the change from iodised collodion to bromo-iodised found in him (Mr. Sutton) its greatest foe; and yet this is almost the only change from Scott Archer's process to the present day. His patent dark box was a marvel of skill and ingenuity, when we consider the period of its production.

Scott Archer was one of those self-denying, plodding enthusiasts in the cause of art and science who do not make fortunes. These are reserved for more astute men, who grasp their ideas, and perceive their money value. He died in 1853, and Bingham in 1874. Had the former lived, who can tell what wealth might have been his?

Towards the latter end of Mr. Sutton's article sundry fears as to what he is doing evidently arise in his mind. Better would it have been had he consigned the whole to the flames. History is not thus written.—I am, yours, &c., Samuel Fry.

*January* 5, 1875.

Obituary.—We much regret to learn the death of Mr. John Watkins the well-known photographer, of Parliament-street, which took place a his residence at Kensington, a fortnight since. He was an artist by education, and gifted with considerable skill and taste.

Decomposed Albumen.—At a recent meeting of the Photographic Society of Philadelphia Dr. Seiler gave an account of a microscopic examination which he had made of some decomposed albumen exhibited by the President at the last meeting. He had found numbers of animalcules known as "*algæ*" in the solution, and offered as an explanation of their presence the passage of air carrying germs of the same into the bottle through the cork or otherwise.

Arctic Exploration.—In selecting officers for the Polar expedition, scientific qualifications in combination with proved seamanship will be esteemed a special advantage. Some professional investigators—such as geologists, naturalists, and probably a skilled photographer—will necessarily accompany the expedition; but where seamanship can be had in combination with special scientific attainments candidates of this class will obtain preference. With a plethora of candidates, some of them enthusiasts, conditions of this nature seem to be dictated by common sense.—*Liverpool Courier.*

A Camera for the East.—We have just seen a magnificent camera which has been completed by Mr. George Hare for an Eastern potentate, H. H. The Maharajah of Punnah. The size of plate is eight and a-half inches square, and from the completeness of the whole, and after an examination of the closely detailed instructions that were given in writing to Mr. Hare, we are compelled to say that his Highness (if it were he that drew up the specification) shows a degree of intimacy with the very latest advances made, in respect of appliances, that could not possibly be surpassed by one living in the centre of London. Everything about the apparatus, including the swinging adjustments of the camera, the slides, and even the camera stand, attests the taste and discrimination of the gentleman for whom it is intended, as well as the skill of the maker, whose name, "by command," together with that of the Maharajah, is emblazoned on a massive silver plate.

The Indianapolis Association.—It is is evident that things are not ripe everywhere for the formation of photographic societies. Referring to a request made by the *Philadelphia Photographer* for certain particulars Mr. J. Perry Elliott writes:—"I hardly know whether I am one of those to whom the request comes or not, for I am sorry—and *humiliated* too—to have to inform you that there has not been a quorum of the Indianapolis Photographic Association present at any meeting for the last *three months*, and consequently no business has been transacted by the Association. I was about to write the 'obituary' of the 'concern,' for practically it is *dead;* but upon reflection I concluded not to do so, as there are still manifestations of life in the head, the right arm, and, perhaps, some other parts of the body, though it must be confessed that many of the members are paralysed badly, and it seems doubtful if the body will ever be restored to former health and usefulness. If it cannot, we shall, in the course of time, lapse into our former secretiveness and selfishness to a great extent, no doubt. I regret exceedingly the apathy that prevails among our members with reference to the interests of the society, and have done about all I could to prevent it, as have a few others, Mr. Judkins in particular."

## EXCHANGE COLUMN.

I will exchange good cameras and lenses, and other apparatus, for good studio furniture and a baby lens.—Address, H., Post-office, Wokingham, Berks.

Enamelling furnace, muffle, &c., &c., by Doulton and Co., cost £3 10s., is offered in exchange for any photographic utility.—Address, G. J. T., 12, Clapham-road, London.

I will exchange a half-plate portrait lens by Lerebours, also a good *carte* lens by Caiffier, studio stand, full-plate bellows-bodied camera, suitable for in or outdoor work, for anything useful not photographic.—Address, J. C. S., 87, Gallowgate, Aberdeen.

A first-class double-geared rolling-press, polished steel plate 25 × 19, and strong painted stand, with two deep drawers for it to stand on, in exchange for Ross's 10 × 8 doublet and camera, or Dallmeyer's 10 × 8 rectilinear and camera.—Address, T. H. Hall, photographer, 125, Marsh-street, Hanley, Staffordshire.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

⁂ With the present number is given the Title-page and Index for our last volume.

M. A.—It is the old complaint—under-exposure and over-intensification.

J. C.—Dawson's Manual (J. and A. Churchill) will answer your purpose.

Juvenis.—Have nothing to do with the affair. It looks very much like a trap to catch the unwary.

Cadmus.—Provided you adopt the precautions stated the gas bag may be used for hydrogen with *perfect* safety.

Brother Chip.—The pictures have all been marked in their order of excellence, as requested, and returned.

A. Findlow (No. 2).—The law of copyright applies to the production of microphotographs equally to those of larger dimensions.

E. S. G.—We have not seen the formula to which reference is made. Will you please indicate the date of the periodical that contains it?

B. (Rotterdam).—If the tones were warmer the prints would be more to our liking. We are glad to hear of your success in business.

Signor Jose de Brunet (San Sebastian).—The *Instructions for Producing Pictorial Effects*, by J. Werge, are at present out of print.

S. Arlidge.—Both portraits and views are rather deficient in softness, owing, probably, to your employing a collodion giving too great intensity.

Palermo.—We thank you for your kind services in connection with the Journal. The promised notes on Sicilian photography will be appreciated.

C. Dalton.—The cloth, a sample of which was enclosed, is suitable for backgrounds, although it would be none the worse for being of a little dark shade.

S. S.—The circumstances you mention are exceedingly unpleasant. The only remedy we can propose is to effect a dissolution of partnership. We shall respect your confidence.

W. S.—The instructions certainly are far from being definite, but they are intended not so much for a tyro as for an experienced person able to grasp and apply the principles.

H. P.—There is now no establishment for the manufacture of the pantascopic camera in this country. We cannot inform you how you could obtain one except by advertising for the instrument.

Subscriber.—1. We cannot speak from personal experience, not having tested the matter.—2. No.—3. The cost will be from a sovereign upwards, the price depending upon quality and place of purchase.

A. B. C.—As your specimens are good, we see no reason why you should not obtain employment as an operator. The possession of good apparatus—even conjoined as it is in your case with ability to use them, will not, how, ever, ensure your getting a situation.

M. D. C.—You do not want "capacity," but we imagine that your organ of "adhesiveness" is but imperfectly developed, seeing you complain of having tried five different dry processes in two months without having succeeded with any of them. Adhere to one for a few months.

A. Findlow.—The microscopic picture must be taken on the slide; the circucular piece of glass merely acts as a cover to protect the picture. The small mounts and lenses to be used in connection with the examination of microphotographs are sold in Paris; we do not know the exact address. They cannot be obtained in this country, so far as we have been able to ascertain.

Giovanni asks—"What is the best form of diaphragm? Ought it not to be square for a square picture, of a vertical slit shape for a steeple, and so forth."——In reply we say that the aperture in a diaphragm must be circular. It is a mistake to suppose that it should partake, in shape, of the character of the leading feature in the subjects to be photographed. We have frequently explained the reason for this.

W. Mackay (Port Blair, Andaman Islands).—What we recommend is the quarter-plate size, or, and perhaps better, the stereoscopic size, with a pair of quarter-plate portrait lenses. For your purpose it will be found advantageous to have the diaphragms placed close to the posterior surface of the front lens. With respect to tents or other preparations for working in the open air you have nothing to learn. We, however, should be glad if you would give our readers a description of the portable developing-box employed by you some years ago. English readers will not be too proud to receive practical information even from the Andaman Islands.

C. Brown.—Kinnear's camera is a very useful form of instrument, closing up in a compact form. It will answer your purpose well. This form of camera is being superseded to a considerable extent by one or other of the kind possessing square bellows bodies.

W. V. H.—The first requisite for photographing children successfully is a good lens. The requirements of a baby lens are great rapidity combined with moderately-good defining powers. A combination the lenses of which are three and a-half inches in diameter with seven inches equivalent focus will prove to be one possessing great rapidity of action. The bath ought to be neutral, the developer moderately strong, and the temperature of the dark room not under sixty degrees.

W. B.—1. Collodio-albumen.—2. Three double dark slides will prove a more convenient outfit for sensitive plates than a changing box; but we suggest the propriety of your taking with you to the field a box containing an extra half-dozen plates, and a small changing hood or bag to enable you to transfer the plates from the slides to the box, and *vice versâ*, should such be required. —3. Three lenses of the foci respectively of four, six, and eight inches will meet all your requirements.

Hypo.—It is quite possible that the spots may arise from the paper; but it does not appear as if this were the case, inasmuch as there is no metallic nucleus to be seen. It is more probable that they are caused by lime, either added to the toning-bath or accidentally derived from some other source. Can you furnish us with a detailed account of the manner in which your printer used to operate? In that case we might, probably, be enabled to point out the precise cause of failure. Have you observed unmounted prints to fail in the same way?

⁂ We are reluctantly compelled to leave over some notices and reviews this week in consequence of the prior claims of the Title-page and Index for last volume.

London Photographic Society.—At the meeting of this Society, on Tuesday next, Mr. G. Hooper will read a paper on the future of the Society, and the means to be adopted for raising the status of the art generally.

Photographers' Benevolent Association.—We remind our metropolitan readers that on Monday next the first annual meeting of this Association will be held at the Co-operative Institute, 55, Oxford-street. After the transaction of business there will be a lantern and musical entertainment, and a display of philosophical apparatus.

South London Photographic Society.—The first meeting of this Society for the new session just commencing will take place at the Rooms of the Society of Arts, Adelphi, on Thursday next, the 14th inst., when, after the routine business, a "popular evening" (to which ladies and friends will be admitted) will be given, consisting of an exhibition, by members and others, of lantern slides by the lime light on a large scale. Tickets (free) can be obtained from any of the members, or from the hon. sec., Mr. Edwin Cocking, 57, Queen's-road, Peckham.

**☞ Editorial Communications should be addressed to "THE EDITORS"—Advertisements and Business Letters to "THE PUBLISHER"—at the Offices, 2, York street, Covent Garden, London, W.C.**

## BRITISH JOURNAL PHOTOGRAPHIC ALMANAC

This valuable work will be ready on Monday next, the 11th inst. For particulars see advertising sheet, page iv., in present number.

All orders to be forwarded to the Publishing Office, 2, York Street, Covent Garden, W.C. To prevent disappointment, 1s. 3d. in postage stamps should accompany each order for a single copy when the work is to be forwarded by post.

## METEOROLOGICAL REPORT,

*For the Week ending January 6, 1875.*

Observations taken at 406, Strand, by J. H. Steward, Optician.

These Observations are Taken at 8.30 a.m.

| Dec. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 31 | 30·26 | E | — | 24 | 27 | 22 | Frosty |
| Jan. 1 | 30·21 | E | — | 26 | 40 | 22 | Foggy |
| 2 | 29·86 | NW | 39 | 40 | 51 | 25 | Dull |
| 4 | 29·90 | W | 49 | 50 | 53 | 45 | Cloudy |
| 5 | 29·95 | W | 45 | 46 | 49 | 45 | Dull |
| 6 | 29·98 | SW | 45 | 46 | 49 | 44 | Dull |

CONTENTS.

# THE BRITISH
# JOURNAL OF PHOTOGRAPHY.

No. 767. Vol. XXII.—JANUARY 15, 1875.

## A NEW LIGHT.

It is not easy to overrate the beauty and simplicity of a new light exhibited at the recent meeting of the London Photographic Society by the President, Mr. John Spiller, F.C.S. Of its origin and the chemical reactions involved we shall not now speak, as Mr. Spiller's communication to the Society will appear in our next number. What was shown to the members we shall briefly endeavour to explain.

A large and strong glass tube having had a small quantity of nitrate of potash placed in it was suspended by means of a stand over a spirit lamp until the nitre was fused. Mr. Spiller explained that a Florence flask had frequently been used by him instead of the tube, and to his great satisfaction. When the crystals were observed to have become fused small fragments of common sulphur were dropped into the tube, and, upon coming in contact with the fused nitre, a light of dazzling brilliancy was immediately produced. This light lasted for several seconds after the dropping in of each piece of sulphur. It was not only intensely luminous, but was very rich in actinic rays; and in the present state of our knowledge we should pronounce it to be very well adapted for illuminating a sitter so as to permit his being photographed by a camera fitted with a quick-acting lens. This, however, is a matter for subsequent investigation.

The expenditure involved in maintaining a light of this kind is so trifling as to be quite astonishing, Mr. Spiller saying that it costs no more than a halfpenny for ten minutes. This contrasts so forcibly with magnesium as to render it certain that, if a nitro-sulphur light apparatus is introduced in a manageable and handy form, it will, to a large extent, supersede the old favourite. Various methods of forming such apparatus suggest themselves to us, but it is yet premature to speak of them.

We may observe that it is an old experiment—well known to, at least, some of our readers—to place a piece of phosphorus in the midst of a small heap of pulverised nitre and ignite it, the light emitted rivalling the popular lecture-room experiment of burning phosphorus in oxygen, of which this is merely a modification. Sulphur cannot be burnt in a similar way unless the nitre be in a state of fusion.

The short period which has intervened between the exhibition of the nitro-sulphur light and our writing these observations precludes the possibility of further comment at present. From the information here given, however, any reader will be enabled to conduct the experiment for himself in the same manner and with the same results as those obtained by Mr. Spiller on Tuesday evening last.

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## THE ADVANTAGE TO BE DERIVED FROM THE STUDY OF ART EXHIBITIONS.

Mr. Alexanders Mackay, in a paper read before the Edinburgh Photographic Society, which appears in another column, gives some sound advice which, if generally followed, would greatly improve the quality of a large proportion of the pictures we are called upon to examine, and are expected to admire, by many amateur and not a few professional friends. The paper is nominally in the form of a letter to a young photographer; but we have no hesitation in saying that there are in it many hints and bits of sound advice that will be found of considerable value to large numbers by no means young in the practice of the art.

It cannot be denied that, during the past half-dozen years, landscape photographers have made wonderful progress in all the technical details of the manipulative part of their practice. The deep blacks, by which foliage was once largely represented, has given place to the charming play of light and shade which, in consequence of the longer exposures now generally given, the small quantity of white light reflected by even the darkest greens is able to produce; and we no longer see the absolutely white skies that were at one time considered essential to a good picture. Although, however, from a purely photographic point of view, the general run of our landscape work may be considered as nearly perfect as we may expect to see it, there is no doubt that in a very large majority of cases it falls much short of what it ought to be in its artistic qualities. There are, as will readily be admitted, a few—only a few—landscape photographers who have by patient study made themselves masters of the situation, and whose works will bear favourable comparison with even the best modern painters in this department of art; but we are constrained to say that, in nine cases out of ten, the point of view seems to have been chosen more as a matter of convenience to the camera-stand than from any idea of the effect of the resulting combination. It is no doubt true that in art, as in music, there are some men born with perceptive faculties, by which they are enabled to see at a glance the point from which the truest artistic effect may be obtained. It is, however, equally true that even the dullest student may, by careful study of the works of those more favourably situated, acquire such a knowledge of that subtle something which no code of laws can fully define, but which goes so far in making the difference between a good and bad composition—between a picture that we feel to be perfect and one that we equally feel to want an essential artistic entity—as will enable him to steer clear of the one and to produce the other.

We heartily endorse the advice given by Mr. Mackay to landscape photographers to study very carefully the works of our modern landscape painters in the annual exhibitions. We do not by any means affirm that all the works of this class exhibited are equally worthy of attention and imitation; indeed, we are rather inclined to say that there are not a few artists who would be all the better of a little study of the works of some of our best photographers. We are, notwithstanding, sure that the walls of the exhibitions, generally, contain many pictures the careful examination of which would prove of immense advantage to a large proportion of our amateur landscape photographers.

By a careful study of the works of our best landscape painters we mean something more than merely looking at their works. That, of course, is all very well, so far as it goes; but the impression so made is apt to be evanescent and easily forgotten. We strongly advise the student to provide himself with a note-book of considerable size, and, having fixed on one or two pictures which have impressed themselves on his mind as types of what a picture should be, to roughly copy their outlines for future guidance. This will be found

a much easier task than those who have never tried it are disposed to believe, as the merest outline will serve to recal to the mind the nature of the composition, and prove a wonderful aid in deciding on the kind of picture to be secured, and on the best point from which to take it, when he goes to the field.

We are, of course, quite aware of the disadvantage under which the landscape photographer labours compared with the ease with which a landscape painter can modify the scene as presented by nature. But this should only stimulate his efforts to overcome the difficulty; and the more carefully he has studied the successes of others, and the more thoroughly he has acquired an acquaintance with the leading principles by which they have been guided, the more likely are his efforts to be certainly successful.

To the student, then, of landscape photography we earnestly say—Be thankful to the chemist, the optician, and the mechanic for what they have done for you; but remember that they have only furnished you with the means to an end. The end itself can only be evolved from your own consciousness of indwelling artistic power and appreciation to make such materials and tools do their work, as translators of your ideas of the beautiful in nature.

We cannot endorse Mr. Mackay's somewhat too sweeping condemnation of the so-called "Rembrandt" pictures, and are disposed to think that he had not in his mind the very beautiful effects now generally produced by many of our best artists. He is himself much too thorough an artist not to be aware of the results of the researches of Sir Joshua Reynolds, who found that an examination of the works of those masters who most thoroughly understood the management of light and shade showed that their practice was to allow not more than a quarter of the picture to be occupied by both primary and secondary lights, one quarter by the deeper shadows, and the remaining half to be in mezzotint or half-shadow. Now, if we know anything of what are styled "Rembrandt pictures" this is just as nearly as possible a description of what they are. No doubt, however, Mr. Mackay was referring to the miserable attempts made by many who seem to think that, to produce this style of picture, what is merely required is to shut out all the light of the studio except a narrow slip on one side—an arrangement which gives the white streak from the forehead down to the chin, and leaves the rest of the face in hopeless shade, without an atom of detail. Such a picture will certainly come under the designation of "the crescent moon," and deserves all that can be said in condemnation of such monstrosities; but it is certainly not what we understand as a "Rembrandt." In spite of this, however, we think Mr. Mackay's paper deserves the attention of all who desire to attain to the highest standard in their every-day work, and we therefore commend it to their attention.

## ON HOBBIES.

In an editorial article on page 3 of this year's volume, headed *Seasonable Suggestions*, we alluded to the fact that year by year the ranks of amateur photographers are becoming thinner and thinner, and we expressed our deep regret that such should be the case. The fact is, indeed, a deplorable one; for our art owes so much to the labours of amateurs that we can ill afford to lose any of them. In optical appliances, as well as in processes, how much we owe to these gentlemen in comparison with our debt to professional photographers and the trade! Take, for instance, the history of photographic lenses. From the Wollaston meniscus and the Petzval portrait combination down even to the Waterhouse diaphragm every really new principle of construction has been suggested by amateurs. The same sort of thing is true to an almost equal extent of processes. In our own country Talbot, Reade, Hunt, and Herschel were amateurs; and so are Major Russell and a host of leading modern discoverers. In France, also, the same rule obtains; for Nicephore Niepce, Blanquart-Evrard, Le Gray, and Tessie du Mothay were amateurs. For a multitude of useful "dodges" we are also indebted to amateurs of all nations; whilst for the most recent and, perhaps, as it may turn out, one of the most important of these—the correct way of making a collodio-bromide emulsion which will keep—we are indebted to Mr. W. B. Bolton, an amateur. There are honourable exceptions to the rule, no doubt; but they are few, and only prove the general truth of our statement that it is mainly to the labours of amateurs that our art owes most of its valuable appliances and processes, and the high state of development to which it has so quickly attained. Surely, then, we must regard the continual thinning of the ranks of amateurs as an evil augury and a prognostic of decadence; and something should be done to recruit this arm of the service. But what? That is just the question to which we will now humbly suggest a reply.

Our line of argument will be this:—First, that every man should, if possible, have a hobby; secondly, that one of the most rational and delightful of hobbies is photography. Yes; every man should have a hobby. It is not enough for him merely to attend to his business, read his paper, go home and dine, and spend the evening asleep in his easy chair. There should be a hobby-horse to ride at home in order to divert his mind from business cares, and start it, for a time, upon an entirely new track. It is essential to his health, both mentally and bodily, that he should have one. *Mens sana in corpore sano* imperatively requires it. "All work and no play makes Jack a dull boy." Every faculty of the mind, and every muscle of the body should be exercised at times, or they decay, and a man becomes a helpless creature in an emergency, without nerve or presence of mind; or else devoid of sound practical common sense, through the habit which he has acquired of viewing everything in the same light and from the same standpoint.

A volume might be written on the subject of hobbies, and an amusing one too. We shall merely point out here that they may be divided into four principal classes, viz., scientific, artistic, mechanical, and miscellaneous, and touch briefly upon each.

A profoundly scientific hobby is rather a serious matter; and if a man's business put much strain upon his mind he had better avoid a relaxation of this sort, or he may end his days in a lunatic asylum. We once knew a schoolmaster, of great talent in his profession, who, after spending the day amongst his boys, used to sit up until midnight working mathematical problems, many of which were contributed to the educational journals. Of course this in time "laid him by the heels," and his digestion was nearly ruined. But there are hobbies which, although scientific, are not vastly profound, and exercise rather the powers of observation than of severe thought. Such are geology and mineralogy, entomology, conchology, meteorology, and other "ologies," which bring a man into contact with nature and make him an interested observer of facts. The microscope will often be a great aid in hobbies of this kind, and is, in fact, a hobby in itself.

Artistic hobbies are very delightful; but here, again, some care must be taken not to overtax the mind, for art is downright hard work when the aim is high, and is not by any means a relaxation. Nevertheless, there is a vast deal of difference between executing a finished work of art, every detail of which teems with thought, and a mere suggestive sketch. There is something, also, very charming in good sketches by a man of cultivated taste, with an eye for colour and composition, and a hand which, by long practice, has been trained to obey the sense of sight and the inspiration of genius quite mechanically. Then water-colour drawing and sketching may be made a delightful hobby and relaxation. Music, again, is a branch of art having an exquisite fascination for many people, and not involving a deep exercise of the brain—it is, in fact, in its very nature a relaxation from sterner pursuits; but it may be carried to an extreme in which melody and sentiment are lost, and nothing left but noisy mechanical execution—the vice of much of the music of the present day.

Mechanical hobbies are, in general, very conducive to health, and they tend to make a man practical in his ideas. What is more, they teach him to sympathise with the poor artisan, and to comprehend many of the difficulties and troubles which are encountered by that very useful class, without whose labours civilisation would cease and society become a chaos. Then, again, how very useful in a house is a man with a mechanical hobby! and how very helpless in general is a man entirely without one! We should all know how to use car-

penters' tools, how to put in a pane of glass, how to bottle a cask of wine, how to solder a leaky pipe or gutter, &c. It is astonishing how much a man may save per annum by knowing how to do little jobs of this kind for himself, particularly if he live in the country.

Amongst miscellaneous hobbies perhaps the most common are floriculture and kitchen gardening; but we should advise our friends to fight shy of amateur farming. Floriculture, even, may be carried to a dangerous length, and may involve a man in much senseless expenditure, and the serious risk is that this hobby may pass into a vice. Beware of it, and stop in time. When flowers are cultivated at great expense—not because they are either beautiful or curious, but simply because they are rare—the hobby becomes a foolish one, if not worse, and many a conservatory has been the main cause of much domestic misery. But wild flowers are quite another matter, and the *hortus siccus* seems open to no earthly objection. Far safer than floriculture is the kitchen garden; and although we may be inclined to smile at the peculiar direction which this hobby takes with many men, still it is less dangerous than the other, and its results are, at anyrate, human food. It generally happens that no sooner does a man begin to cultivate cabbages and potatoes than the idea of size begins to grow upon him, as well as getting things for his table which are strangely out of season. He must have giant rhubarb, cucumbers as long and as straight as a yard measure, mushrooms as big as a frying-pan, monster gooseberries, green peas on Christmas day, and grapes in April! Well, all this is amusing enough, and his hobby, at anyrate, takes him out-of-doors, and is not a sedentary one.

And now comes the question whether it may be possible to find a hobby which shall combine the chief merits of all the rest, and which may fairly be entitled to a place in *any* of our first three classes—a hobby which shall be at once scientific, artistic, and mechanical; which shall take a man much into the open air, and bring him into contact with nature; which shall improve his taste for the beautiful, and develope a whole set of new faculties; which, in a word, shall improve both his mind and body, shall be but a small drain upon his purse, and the results of which shall be a never-ending source of innocent amusement and gratification to himself and his friends. Such a hobby, we think, is photography; not, perhaps, portraiture—for that is a matter of much greater difficulty than many people suppose—but landscape photography.

It remains, then, to show that this delightful art has now turned over a new leaf in its history, and has passed into a phase which renders its practice much more economical and enjoyable than it has hitherto been; that it has now, in fact, been divested of most of those drawbacks which have caused so many to fight shy of it, and has become adapted to the wants of a large class of persons in search of artistic and rational relaxation from sterner pursuits. All this we are prepared to prove, and also to show how the hobby may be carried out practically, by describing minutely the process and appliances which the amateur should employ. But this cannot be dragged in at the fag end of an article which is already long enough. We therefore lay down the pen for the present, with the promise of concluding the subject in our next number. Our suggestions will then be open for discussion, and it will remain for the trade to consider whether it will be worth their while, by supplying the special articles we shall recommend, to endeavour to smooth the way for a large class of persons who, we are satisfied, would willingly become amateur photographers if the road were made easy and intelligible to them.

## ON THE SOLUBILITY OF CHLORIDE OF SILVER IN A SOLUTION OF THE NITRATE.

I believe it is Hardwich who says there are no compounds of the bromide and chloride with nitrate of silver similar to that of the iodide, and therefore it is not necessary to saturate a bath with these bodies previous to use. This may or may not be a fact; and I should have been inclined to act as though the author of the above statement was in error, owing to something I read a short time since in the Journal to the effect that the printing bath with an increase of temperature dissolved a portion of the chloride of silver formed in the paper, and left it (the paper) in such a state that the image was produced in the body of the albumen, and so was removed from the influence of the toning solution; in short, thus explaining one of the difficulties of toning. I say I should have been inclined to doubt Hardwich, had it not been for the unscientific remedy proposed at the same to obviate the difficulty, for at first the explanation appeared very plausible.

No one, however, is justified in assuming another to be in error in every particular because he happens to be so in one case. This manner of reasoning out general conclusions would leave very few indeed with any reputation for accuracy; so in the given case I determined to settle the question for myself, and as it is possible that the method employed may be interesting to your readers I venture to give details.

It must be stated that I only pretend to have done that which satisfies me, so far as regards the practical bearing it has upon printing operations. Where scientific truth is required chemical balances may be used. The first difficulty presented itself in the extremely small quantites employed, and this made it evident that it was not in the printing bath the chloride must be sought for with any chance of success; and, further, the slight solution of the albumen, evidenced by the discolouration of the bath, would effectually prevent any analysis being worth anything as giving a reliable result, for how could you be certain the chloride, if found, was owing to the solution of the chloride itself or of the chlorised albumen?

Dealing with the paper appeared to me to present insurmountable difficulties. The slighest solution of the albumenised surface with the bath would at once throw out all your calculations. In fact, analysis in both cases would be like employing a ship's cable to hang a cat; you might or might not succeed. The means taken to obtain the required information does not appear to me to be liable to any sources of error, provided the sensitiveness of the tests can be relied on. Of that, so long as the method is detailed, photographers can judge in a manner far different than any mere affirmation would enable them.

A quantity of albumen was salted with the chloride of calcium, and two three-inch square plates coated therewith in such a manner that upon weighing them they each contained one-tenth of a grain of the chloride. These we will term "albumenised plates Nos. 1 and 2." A portion of plain collodion was salted with the same chloride, and it was so diluted that two three-inch square plates when coated therewith also contained one-tenth of a grain of the chloride. These we will name "collodionised plates Nos. 1 and 2."

A new forty-grain nitrate of silver bath was prepared, and collodionised plate No. 1 and albumenised plate No. 1 were immersed therein for four minutes, then taken out and washed. Collodionised plate No. 2 and albumenised plate No. 2 were then similarly immersed, with the exception that, instead of four minutes, seventy was the time of immersion. For ten minutes of this time (it may be said it was the last portion) the temperature was slightly increased; thus, in all, these plates were in the bath 17·5 times No. 1. The collodionised plates had a very slight opalescent appearance, something like the blueness occasionally seen on glass, and No. 2 (the longest immersed), so far as the eye could judge, was, if anything, the most transparent, but it was so slight as to make it a matter of doubt if there were any difference; and when it is borne in mind that under these circumstances there was only 0·258, or very little over a quarter of a grain of chloride of silver spread over nine square inches, it is but reasonable to assume that if the silver solution had any solvent powers worthy of notice it would have dissolved the whole, there being 800 grains of the nitrate present for each plate, or over three thousand times the weight of chloride.

The albumenised plates were both quite transparent, which result was anticipated. Collodio-albumen workers will not be at a loss to find a result somewhat analogous to this in the transparency of their plates. The four plates were then exposed to the action of daylight so long as it took one of the actinometers supplied by the Autotype Company to make one tint, and the result was:—Collodionised plates Nos. 1 and 2 were alike both in colour and transparency; albumenised plate No. 1 was of a decided red colour, the known violet tinge of the chloride when acted upon by the light being quite overpowered; No. 2 was decidedly darker—in fact, was decidedly the most sensitive of the two.

The collodionised plates were printed right through, and a continued exposure produced no difference in them; and the fact of their similarity, so far as regards colour and transparency, would appear, when connected with this, to indicate an amount of chloride in each as nearly identical as can be obtained. With the albumenised plates this did not hold good. I mean they could not be compared as they

continued to darken; but this was evidently owing to the organic silver compound, and did not depend on the chloride.

Bearing in mind the small quantities used, the deduction I make from the foregoing is that if any chloride be dissolved by the bath it is so slight as to be entirely neglected in practice. If toning difficulties do occur (and they will), do not make voyages, figuratively speaking, to the antipodes to find a remedy; but look nearer home.

W. E. Batho.

## EXTRACTS FROM A LETTER TO A YOUNG PHOTOGRAPHER.

[A communication to the Edinburgh Photographic Society.]

My dear Friend,—According to promise I now send you a few notes upon the subject of photographic art. You are aware that, practically, I have no knowledge of photography whatever; but, as you have some confidence in my experience in my own business, I shall give you at random whatever occurs to me as having a bearing upon those studies you have so much at heart.

I shall, first of all, say a few words regarding schools of thought. Sir Joshua Reynolds, in his first discourse, truly remarks:—

"Every seminary of learning may be said to be surrounded with an atmosphere of floating knowledge, where every mind may imbibe somewhat congenial to its own original conceptions."

Let us see, then, where this atmosphere may be most freely and advantageously inhaled.

To those outside the pale of art picture galleries are fast becoming sources of art-education; indeed, it is chiefly by such means that a knowledge commensurate with the growing desire for intellectual improvement can adequately be obtained. From the statistical accounts published from time to time we see how largely those institutions are visited by the public.

With a well-compiled catalogue it is astonishing how much a person may learn in a short time of the art of his own and other countries. It is deemed a gentlemanly accomplishment to be able to say something of the painters of other days, both foreign and native, as well as of the celebrities of our own time. In most of our large cities such places of resort are to be found, and were they generally open in the evenings they would, no doubt, be largely attended by the more respectable of the working classes. The directors of such places should see to this. To aspiring photographers there cannot possibly be better schools for acquiring a knowledge of those principles which, to a certain extent, govern their own art, and as such they should be highly commended.

To the followers of your art in Glasgow such a school exists in the corporation galleries there, which contain many fine works both in portraiture and landscape. To those whose inclinations lie towards landscape art I should say that the study of such works of acknowledged reputation ought to evoke something like a feeling of inspiration.

What I have often noticed as a defect in photographic landscapes is their want of unity; they seem to be only sections of scenes. This, I believe, in most cases cannot be avoided, especially in subjects embracing a great extent of country. I have known landscape painters move from point to point—say a distance of twenty or thirty yards—to secure some object, for the purpose of strengthening their pictures; it might be a mass of rock or a stout old tree. This, in connection with the manœuvring of lights and shadows, is often the means adopted for preserving the unity of their works, or, in other words, making them complete within themselves. They give abstracts of truth rather than total truth. This the camera cannot do; but it might, at least, be placed in relation to objects that would be valuable as foregrounds. To have the power of balancing a scene with an artistic eye must be an important object; and our best landscapes might be often referred to with a view to obtaining that end.

Amongst the many portraits in those galleries you must allow me to allude to one by Sir Joshua Reynolds, which every photographer should examine as often as possible. It is that of Miss Linley, the mother of R. B. Sheridan. This is the *beau ideal* of portraiture—perfect repose; superb breadth of light and shadow, finely-balanced; the background a darkness visible, out of which looms the lovely head, composed of the most charming and luminous hues of roseate and pearl. Such a picture, to a student of little capacity, would suggest a photograph that could scarcely be surpassed.

Let me now say—"Happy should be the photographers who reside in Edinburgh, and who have the privilege of breathing the atmosphere of our National Gallery." We have here a collection of portraits by all the more distinguished masters, such as seldom can be seen—from Sir Anthony Vandyke down to Sir John Watson Gordon, embracing a period of 200 years. All the approved maxims of art in relation to portraiture are here expressed, from the broadest generalisation of effect to that of the most infinitesimal and painstaking detail.

I had occasion, in a former communication, to refer to several of these productions, which, let me say, cannot be studied too intently. Let me call your attention to two or three I formerly omitted. I would have you to look at the portrait of the late Thomas Duncan, R.S.A., painted by himself, which is, perhaps, the finest of all this painter's portraits, and he painted many very fine ones. As an embodiment of artistic power this work has few equals, and it is remarkable for the absence of all meretricious colouring. The round, well-developed head floats in an atmosphere of sober browns and greys. In neutrality of tone, indeed, it is not unlike a deep, rich, brilliant photograph, and may be looked at again and again with invigorating effect.

Let me mention here that simplicity of arrangement and quietness of colour are unfailing sources of grandeur in this branch of art. Let us look at the whole-length portrait of Sir John Watson Gordon, by John Graham Gilbert. Here the *tout ensemble* is complete. How firmly the late President stands! How calm and dignified the expression of the head, which is admirably like the man! How powerful, yet subdued, the colouring, and all characterised by the most perfect finish! It has been remarked by eminent artists that there are few finer portraits, if any, in Europe.

I shall only now allude to the characteristic half-length portrait of the late Lord Murray, by Sir J. W. Gordon, which I also wish you to look at. Did space permit I could point out many other noble works; but my object in this letter is to send you there to see for yourself, as to a school, where by a little diligent attention you cannot fail to be vastly benefited.

In the annual exhibitions of the Glasgow Institute of the Fine Arts and the Royal Scottish Academy are to be seen the best works of the present generation of painters, and you would act wisely in paying them occasional visits for the purpose of elevating your taste.

In addition to the sources of education above referred to, I may state that there is a growing desire on the part of populous communities to have annual exhibitions of their own, consisting of paintings, sculpture, architecture, articles of *vertu*, and, in some cases, articles of manufacture. To these exhibitions our best artists are invited to contribute. County noblemen and gentlemen are always willing to take an active part in such movements, and often send a few of their choicest pictures to give tone and character to the display. Let me instance the exhibition recently open in the Smith Institute, in Stirling, which was highly interesting, as being the first of what is intended as a series of annual exhibitions. Here, apart from the works sent direct by Scotch and English artists, there were many lent by such gentlemen as Sir W. S. Maxwell, Bart., of Keir, Mr. Wilson, of Banknock, Colonel Wilson, of Bannockburn, and many others who have valuable collections, all of a deeply interesting and instructive character. The enterprising town of Kirkaldy, too, has already had two consecutive exhibitions of highly-respectable ability. Inverness and Aberdeen have, likewise, been bringing together the *chefs d'œuvre* of their respective counties, and, I understand, with very great success.

Now in each of these exhibitions there must have been a considerable number of pictures by the first masters, especially in portraiture. There are very few of our old baronial residences which do not contain many very fine family portraits. Raeburns there must be in abundance, as well as many by Jamieson and Reynolds, and even a Vandyke may occasionally be found. Now, what I would wish to impress upon a photographer is the fact that the contemplation and study of such works, if he be at all a susceptible being, would tend to form a basis of good taste. Here are the works of men who have devoted many laborious years to their art, who have travelled through many lands for the purpose of becoming familiar with the masterpieces of other times, and who have not only caught their spirit but, in some instances, have "snatched a grace" beyond them. It is good to have such pictures floating, as it were, in the mind's eye, so that, in posing sitters, some regard may be had to pictorial effect. In none of those works will you find anything approaching to whiteness in the backgrounds; these are generally transparent masses of moderate depth, with the heads rising softly out of them. It is a fallacy to suppose that relief can be obtained by striking contrasts; delicate gradation, melting into the deeper shadows, will alone give it. By all means, then, avoid blackness and whiteness, or that feeling of solarisation which too many photographs have, and which are utter abominations to all who are not either perversely blind or obstinately stupid.

There is another matter concerning the management of portraiture to which I shall take the liberty of referring. I mean, not reflected lights, which are generally so many degrees below the principal or daylight of the picture, but *all-sided lights*, which not only destroy all roundness, but invariably produce the most grotesque squints. In small *cartes* this may pass muster with those who are not particular to a shade; but enlarge them to the size of life, and you will at once find what a miserable result you have. If at all possible let your light always flow from one direction. I press this upon you as of much importance.

Let me say here that a most reprehensible practice in your art is that of touching negatives—I mean beyond the removal of mere specks. A portrait can only be acceptable in proportion as it represents the character of the man—in the faithful rendering of his facial development; and to fritter this away with the avowed purpose of softening or beautifying the head is the most absurd of all absurdities. I do not think the public are at all clamorous for touched *cartes*. It seems to me to be an itching some have to make their work pretty—yes, alas! merely pretty. They do not consider the sacrifice they make. If photographs were taken under a well-disposed, one-sided light, with a befitting background, there would be no necessity found for touching. There is no reason why negatives should not be very complete; and when they are not so it must arise from the absence of a preconceived mental arrangement of the subject. Thus—

"Evil is wrought by want of thought,
As well as want of heart."

I sincerely hope that henceforth we shall have as little touching as possible. We should have none of it, especially in the portraits of distinguished men. The great men whose memories the people cherish and revere they wish to see as they appeared in the flesh. Among celebrated divines, for example, we have in their purity portraits of Drs. Chalmers, Macleod, Guthrie, and Candlish—all wonderfully characteristic heads. Another great name has just occurred to me—that of Hugh Miller; and I would ask who would have dared to polish down his rugged front? To tamper with such heads would be transmitting a lie to our successors; it would be depriving posterity of its hereditary rights.

I desire now to direct your attention to what are called "Rembrandt" portraits. This, I am afraid, is rather a comical misnomer in as far as bearing any resemblance to the portraits by Rembrandt. I should like to know the point of contact, or the principles on which they have been thus christened. The luminous transparency of that great master's works has been, and will continue to be, the admiration of every succeeding age. In many of his pictures there is not above ten or fifteen per cent. of positive light; but the remainder is by no means blackness, but a glowing darkness in which the details are almost as well made out as in the more prominent parts. I had sent me, recently, for enlargement, heads of a lady and gentleman in this particular manner. The heads were totally in shadow, excepting that down the off, or narrow, side of each there was a clear, sharp outline of light, which, in the gentleman, also struck the outline of a well-pronounced aquiline nose. Both heads reminded me forcibly of the moon nine-tenths in eclipse; and, had they been enlarged, their appearance would have made both day and night hideous. Of course they were declined, and ordinary *cartes* substituted with marked advantage.

In the foregoing observations I think you cannot fail to see my drift. I have been very frank in pointing out to you the means by which you may purify your taste. I have given you an untouched photograph of my opinion on the several matters alluded to; and, on consideration, you will just take it for what it is worth. I am very anxious that you should leave no stone unturned by which you may acquire a thorough knowledge of your business. You should lose no opportunity of becoming familiar with works of established reputation either in early or more recent times. Books upon art are not numerous, and, after all, are little else but dumb show to the uninitiated. The study of several good pictures will appeal more eloquently to your feelings than many volumes, merely theoretical, could possibly do.

With regard to objects of photographic study I may say a few words. With the exception of works purely historical, or those compositions that appeal more immediately to the imagination, there is scarcely anything in nature out of your province, which fact has already been amply proved, although in the mass of subject-matter at your command there will always be a difference in degrees of excellence. Scotland is peculiarly rich in magnificent scenery. Amongst those monuments of creation, the "everlasting hills," you may feast to your heart's content; in fact, over the whole of the "land of mountain and flood" you may range. In noble architecture, too, which Gœthe somewhere finely calls "frozen music," there is a superabundance of *materiel*. Our old castles are a never-failing source of interest, and those of our own country would form rather an imposing album.

Let us not forget our old baronial trees—our druidical oaks, especially—with their fine sinuousity of "branchification." What useful auxiliaries to the landscape painter would photographic collections of our gigantic trees be! I do not mean for servile copying or adaptation of any kind, but simply for their suggestiveness. I have in my possession an excellent photograph of an old ash, uprooted by the severe storm of two months ago, on the estate of Robert Dundas, Esq., of Arniston. This tree had attained a somewhat patriarchal age, being no less than four centuries' old. In its prostrate condition it forms a very agreeable picture, however. It stands out against an immense beech, the height of which forms the principal point in the composition. This is a work by our treasurer, Mr. Pringle.

It seems to me there can be nothing more worthy of attention than magnificent ruins—the excavated remains of cities thickly peopled in times long past. They strangely kindle our emotions—probably from the fact that we associate those objects with this human feeling. To contemplate them without irrepressible awe is simply impossible. "Our fathers, where are they?" must rise to every human lip. I think, also, that the simple photographic tone is the best medium by which such objects can be expressed, as if being starved of even a glow of colour adds more intensely to the feeling of their utter desolation. The feeling I would like to express has been frequently shown in the Queen-street Hall; and at the very last meeting we had a most brilliant display, by the oxyhydrogen light, of *Egypt and the Nile*, and in the exhibitions of her ruined temples we had many glimpses

"Through the dark postern of time long elapsed."

I would now only remark to you that truth—absolute and uncompromising—must ultimately prevail, and anything that bears not that sovereign stamp in all the human intelligences will inevitably perish. Truth—that small but significant word—is all-powerful. The vast systems revolving around us in the heavens are regulated in obedience to its spirit, as it is one of the principal attributes of the Deity; for He is truth as well as love.—Yours, &c.,

ALEXANDER S. MACKAY.

## FADING.

I AM glad to find by letters in the photographic journals that the attention of many leading photographers is again addressed to the all-important question of the fading of silver prints. I think all old photographers should give us the benefit of their experience by mentioning the steps they have taken to secure the permanence of their pictures, and also the results. If they will take this trouble, I am sure we shall gain much useful information. Not wishing to preach what I am not prepared to practice, I shall tell what I have done; but, before I do so, I may mention that I have been an amateur photographer for a great many years.

I began with daguerreotypes in, I think, 1843 or 1844. I have tried most of the processes which have since been brought out—Talbotype, calotype, wax paper, wet collodion, and dry plates. I have devoted much time and attention to this most fascinating pursuit; and it is no great exaggeration to say that for the last thirty years very few days have passed without finding me occupied with some branch of photography.

The results of my labours lead me to take a more cheery view of the permanence of silver prints than most photographers do. I believe that the fading of these prints is almost entirely due to some trace of hyposulphite of soda having been left in them.

It was, I think, in 1856 or 1857 that the Photographic Society of Scotland, of which I had the honour of being vice-president, held its first exhibition in Edinburgh. I sent a great many pictures to that and the following exhibitions of that Society. I have now in my house, hanging in the rooms, a great many of these pictures, with the numbers of the exhibitions still on the frames. With two or three exceptions, they are all in *statu quo*—no trace of fading to be seen. But I can go back to 1854, and produce unfaded pictures of that date.

Here, then, we have prints which have stood the test of twenty years, although I lately read a very doleful letter in your Journal, by one of our greatest London photographers, in which he said that few, if any, prints could be found that had lasted fifteen years.

Mr. Tunny, a well-known and most successful Edinburgh photographer, taught me the collodion process. He impressed on me the necessity of washing out the last trace of hypo., and I have tried by various arrangements to do so ever since.

In Edinburgh I had no convenience for washing prints; but I managed to do so by giving the prints from fifteen to twenty changes of hot water, and then a few washings in cold water. I placed them in a flat dish—not more than two or three at a time—and did not leave them in the hot water more than from one to two minutes. I was always careful to drain off the last drop of water in the dish. It is a great mistake leaving prints to soak for a length of time in the same water. It is the constant change of the water, and not length of soaking, that removes the hyposulphite of soda.

I reside the greater part of the year in the Highlands of Scotland, and for the last sixteen or seventeen years have adopted a very sfmple arrangement, by which, without any trouble, I can thoroughly wash my prints. I had an oblong box of block tin made, about two feet long and sixteen or eighteen inches broad. At each end, and for the whole breadth of the box, there is perforated zinc. There are two trays, so that I can have three batches of prints in it at a time.

I place the box in a stream, and allow the water to flow through it for four or five hours. Supposing the stream to run at the slow rate of a mile an hour, the prints must have between eight and ten thousand changes of water in five hours. Notwithstanding this thorough washing I have had faded prints, but it was owing to having put too many in a tray; the stream rushing through the zinc netting crushed them in a mass against the end of the box, and in that way the prints inside the mass were not properly washed.

Photographers resident in towns cannot adopt this plan of washing; but most of them can command a tap of water; and, with a tub of block tin, a hole at the low side, a syphon, and a gutta-percha pipe communicating with the tap, they can wash their prints very well, provided they do not put too many in the washing-tub at the same time.

I mounted my prints in former years with flour paste, but latterly with starch—*always having it fresh made.* I see this mode of mounting pictures is pronounced to be "*certain destruction*"!! It has not proved so in my case.

I conclude this communication by saying that during the last twenty years I have printed many thousands of prints, and I have had thousands of failures; but these failures were, I am satisfied, due to some inattention in washing out the hyposulphite of soda. When that operation has been thoroughly carried out my prints have stood the test of many years. HORATIO ROSS.

## THE PROGRESSIVE RESULTS OF THE PAST SESSION.

[A communication to the Edinburgh Photographic Society.]

THE photographic annals of 1874 are not difficult to write. The year has not been marked by great advance in any department; no wonderful improvement has been made, either in apparatus or manipulation; and hardly even has there been a claim set up for the introduction of a new process. Although, however, nothing very striking has occurred, there has undoubtedly been a continuous steady progress. "Upwards and onwards" has been the motto which the whole body of workers have had before them, and the result is a more general diffusion of the knowledge of the theory and practice of the art, and a more general production of high-class work. In fact, there is nothing in which progress is so visible as in the improvement which has taken place in the pictures produced by even the best photographers—a progress of the right kind, as, after all, the picture is the ultimate object, and that to which all our operations tend. This desirable result is being brought about mainly, I believe, in consequence of the fact that photographers are, year by year, placing less dependence on tools and *matériel*, and trusting more to the mind that guides their right use.

Although, however, there has been no particularly striking discoveries or improvements made, experimentalists have not been altogether idle, and there are a few items of sufficient interest to profitably occupy our attention for a few minutes. Photography is largely indebted to photographic societies for its present position, and therefore I think the London Photographic Society may fairly be allowed to first claim our attention. During the early part of the year it passed through a severe ordeal, and was as nearly as possible stamped out of existence—not by enemies, but by those on both sides who loved it well. There were, no doubt, faults on both sides, as there generally are in all serious disputes; and it is a matter of congratulation that the breach has been healed, and that all seem now willing to work harmoniously for the general good. The Society has done good work in the past, and I hope it will have a prosperous and profitable future. I cannot help thinking, however, that a mistake has been made in seeking, by altering the title, to extend its influence beyond its fair, legitimate sphere. The merely calling it the "Photographic Society of Great Britain" will not help much to make it what the name implies, while it may retard for a time the action of those who are anxious to see the formation of a really national association—an institution free from local association or influence, without connection with any existing society, but supported by the members of all. I trust the members of the parent society, for which all her true children have a filial regard, will reconsider this matter, and I have no doubt they will come to see that in the great city in which they dwell they have a sufficiently wide field for their operations, and that they will be ready to give their surplus energy in aid of the formation of a really national photographic association.

Collodio-bromide seems to have passed from the domain of discussion, and taken its place amongst the recognised reliable processes. It has, however, during the year—mainly through the experiments of Mr. W. B. Bolton—been vastly improved. Some time in January he published a method by which an emulsion free from any soluble salt could be made, and which simply required to be poured on the plate and dried to be ready for the camera. Subsequently, Captain Fox suggested the addition of oleate of silver; and the process thus improved is, in my opinion, the most valuable addition to our knowledge that has been made during the session.

Dr. Draper—I think in 1872—showed us that we were mistaken in supposing that actinism was confined to the violet or blue ray; and, during the past year, Dr. Vogel has tried to show the conditions under which any of the rays might be made to act on a sensitive film. He found that when the film was stained with, say, a green, that the ray complementary to that, the red of the spectrum, impressed itself; and so, in like manner, with the other colours. This, like most new things, met with considerable opposition from various quarters, and both Dr. Monckhoven and Mr. J. Spiller wrote strongly against it, mainly on the always insufficient ground that they could not reproduce the effects. One, at least, of these clever experimentalists has changed his opinion; and I think we have sufficient evidence to warrant the belief that there is something in it. If so, I have no doubt that the discovery is likely to lead to a method of combining colour with our films in such a way as to revolutionise our ideas of reproducing coloured objects.

Printing has, as usual, received considerable attention. Carbon continues to make steady progress, and prints by various methods are being daily produced quite equal to anything that can be produced by silver printing. Considerable discussion has taken place as to the best means of removing the hypo. from the paper; but the end of the matter is, in my opinion, that plenty of washing is the only safe and certain remedy for fading, the mischievous teaching of Mr. E. Dunmore, in THE BRITISH JOURNAL OF PHOTOGRAPHY of December 25, to the contrary notwithstanding.

Early in the year there was published a process by Mr. Willis, jun., for the production of prints in reduced platinum—a process which would, I believe, give perfectly permanent results. The process is based on the fact that salts of platinum are reduced by oxalate of iron, and is as simple as ordinary silver printing. Why it has not attracted more attention I cannot understand, and am certain it only needs a trial to show its value.

In calling attention to a method of reproducing negatives by what is known as the "dusting-on" process, Herr Obernetter has earned the gratitude of all photographers, and its application in the production of backgrounds, or for composition printing, as suggested by Mr. Werge, is likely to be extremely useful. Photographers are, however, a conservative race, and it may be some time before the process comes into general use; but I have no doubt that, by and by, no good or valuable negative will ever be risked in the printing-frame, but only used to make what may be fairly called an "Obernetter duplicate."

Gelatine has not yet taken the place it was expected to do. Several operators succeeded in getting with it both fine and rapid results; but the emulsions were uncertain, and subject to rapid variation. To obviate this Mr. R. Kennett hit on the idea of drying it into a pellicle, which needed only to be dissolved in water to be ready for use, and he was foolish enough to carry the idea to the patent office, hoping, doubtless, to make a good thing thereby. I need hardly say that I am not sorry to hear that he has been so far disappointed, as if everybody who devises some trifling improvement in manipulation or *matériel* were to tie up his little dodge with patent tape real progress would soon come to an end. The pellicle has not taken, but it is a good thing for all that; and I heartily recommend those interested in the matter to try it, assuring them that they are quite at liberty to make the pellicle for themselves, Mr. Kennett's patent notwithstanding.

This paper would hardly be complete without some notice of the work actually done, as a result of processes and *matériel.* Time, however, will only permit of my referring to one single item, the publication of Thomson's *China*—a bold effort, successfully carried out, in the production of the largest and best single work that has as yet been attempted. Most of the members of the Edinburgh Photographic Society have had an opportunity of seeing specimens of Mr. Thomson's work at the two "popular meetings" for which he was kind enough to give the pictures; and I am sure they rejoiced as heartily as I did when they heard that the Queen had expressed her admiration of his work by giving him a gold medal.

Little that is new in tools has been introduced. The symmetrical lenses of Ross and Co. have met with much favour. They are, no doubt, very good; but I think their popularity is to be attributed to their small size, and the fact that they all fit into one flange. This is, undoubtedly, a move in the right direction, and will, *cæteris paribus*, give them a preference.

The only other thing of mark is Weston's rotary burnisher, and it really is astonishing how almost universal the use of this has become. Notwithstanding its absurdly high price I have hardly visited a studio in connection with which it was not to be found, and most of the members know that during the latter part of the year I have gone over a good deal of ground, and in every case the instrument was giving entire satisfaction. I have seen quite as good a surface produced by the ordinary rolling-press with hot plates; but the simplicity of the burnisher, and the ease with which it can be wrought, has enabled it to almost supersede all other presses—at least for small work.

I must now bring this *résumé* to a close. From what has been said it will be evident that, although no great thing has been accomplished, the year has not been barren of good results. A quiet, steady progress has been maintained, and there is abundant evidence that our much-loved art is not on the wane—nay, that it is only step by step approaching that maturity which shall be its day of great things. All who, either directly or indirectly, lend a helping hand in carrying on the good work have much reason to congratulate themselves on the present position and future prospects of photography.

JOHN NICOL, Ph.D.

## FOREIGN NOTES AND NEWS.

CHLORIDE OF ZINC AND ITS USES IN PRINTING.—YELLOW SPOTS.—BECKETT'S PATENT.—INDIA-RUBBER FILMS.—HELIO-ENGRAVING.—RECENT DISCOVERIES OF ANCIENT SCULPTURE IN ROME.

THE *Annales du Genie Civil*, alluding to a process of tanning leather by chloride of zinc, invented by MM. Meritens and Kresser, states that these gentlemen have conceived the idea of improving the sizing of paper by employing the reaction of chloride of zinc. This salt, dissolved in about twenty times its weight of water, will render paper less hygrometric and the gelatine sizing less putrescible. It is also thought probable by the above gentlemen that the peculiar reaction of chloride of zinc with gelatine may be turned to account in the process of printing photographs in fatty ink from gelatine films. In this process, as at present practised, some inconvenience arises from the fact that the purest gelatine is not quite free from grease, which attracts the ink and interferes with the clearness of the whites of the proof; there is also a want of toughness in the gelatine film, which renders it always liable to injury in printing. These evils would probably be diminished by immersing the gelatine film in a solution of chloride of zinc.

It seems not impossible that chloride of zinc may find some important use in the preparation of albumenised paper for printing as a substitute for the other chlorides now commonly employed. It is a powerful antiseptic, and, although a highly-deliquescent salt, might probably preserve albumenised paper from putrefactive change. Then, again, if paper coated with plain albumen and dried were floated upon a *hot* solution of chloride of zinc the albumen would, perhaps, be coagulated and salted at the same time. The experiment would be worth trying, for chloride of zinc seems to have some power of coagulating albumen even when the solution is cold. Be that as it may, it is worth trying this chloride in the printing process. We must remind the reader, however, that there are other chlorides which coagulate albumen with much greater energy—for instance, the chlorides of gold, platinum, mercury, copper, and iron.

Dr. Gayer attributes the yellow spots and fading of prints in some measure to the practice of fixing them in daylight, and, also, to the slow drying of the size in the paper.

French photographers seem to be greatly amused by a patent which has been lately taken out in England by Mr. James Beckett, for albumenising paper on both sides by immersing the sheet in the albumen—a feat which we have ourselves performed scores of times many years ago! Evidently our patent laws require some modification. Alluding to this process, M. Davanne is of opinion that so far from diminishing the risk of the print fading it would increase that risk; for, even supposing that the hyposulphite should find more difficulty in entering into the interior of the paper, when once there the difficulty of getting the enemy out again would be vastly increased. It would be like shutting up the wolf in the sheep-fold. M. Rousselon has wisely remarked that albumenised paper prints, being much less permanent than plain paper ones, the more albumen that is put into the paper the greater will be the risk of the print fading. On the whole, therefore, we are afraid that Mr. Beckett's patent process of albumenising will not find much favour in France.

M. Franck de Villecholle warns photographers against the practice of transferring their negatives to films of india-rubber. These films become oxidised and reduced to powder by the action of air and light.

M. Rousselon has publicly stated that his process of helio-engraving has now entered fully into the domain of industry, and that he can produce plates which will yield 8,000 proofs without any perceptible deterioration—thanks to the process of "acieration." He would even engage to pull 20,000 proofs from one of his photo-engraved plates.

Some important discoveries of ancient sculpture have lately been made in Rome by workmen who were clearing a portion of the Esculine for new streets. Of these the most important seems to be a nude statue of a youthful Venus, of marvellous beauty—a something even to put to the blush, if she have any shame in her, the famous Venus de Medici. Another interesting relic is a remarkably fine bust of that amiable character, the Emperor Commodus. Sculptors were not flatterers in those days, and the portrait has been recognised by its villainous expression—always faithfully preserved. An entire wall has also been discovered built of relics of statues! It is said that the number of statues in the streets of ancient Rome exceeded that of the population. Amongst the still unexplored mounds of rubbish in the modern city what treasures of art may yet lie buried for the delight of future discoverers and the adornment of galleries of antiquities!

## AN EVENING WITH THE "BENEVOLENTS."

ON Monday evening last, the 11th inst., an attempt was made, for the first time in London in connection with photography, to combine business, instruction, and recreation, if not amusement.

The occasion was the first annual meeting of the Photographers' Benevolent Association, and the attempt was eminently successful despite the absence of some of those whose names appear as occupying official positions. We were greatly pleased to see such a large gathering from the class of *employés*, who, with their wives, daughters, and other friends of the gentler sex, swelled the numbers until the large hall in which the meeting was held might be considered to be comfortably filled. Never did Mr. Statham (for it was our estimable reverend friend who presided) seem more at home than when addressing this large assembly of the photographic rank and file, eloquently urging upon them the claims of the Association and setting forth the advantages that would accrue to themselves by their connection with that body.

The concert which followed the short period devoted to business was very energetically carried through by both amateur and professional photographers, who, with the assistance of a few talented lady friends, presented a large and varied musical programme, consisting of songs, duets, glees, part-songs, and performances on the pianoforte. Mirth and good humour prevailed, and all present seemed pleased.

The great length of the musical portion of the entertainment caused the lantern exhibition, conducted by Messrs. Oakley, York, and Ferneley, to be too hurriedly got through. It was, however, a most successful exhibition, subject to one drawback of an important character—nearly one half of the pictures were projected on the screen without a single word of explanation in connection with the subjects, and the remainder were introduced by merely the bare enunciation of the designations of the pictures. This was a great mistake. It would have been much better to show only a small number, and allow the spectators proper time to note

the salient points of each illusiration aided and directed in this by a few descriptive words. For example: two fine transparencies by the Woodburytype process were projected upon the screen with the exceedingly curt respective announcements "Niagara Falls," and "Niagara Falls in Winter." Now if those present had all been fellows of the Geographical Society this bare announcement might have been sufficient; but, under existing circumstances, how much better would it have been had a few words been spoken, or even read, to the following effect, and in giving them we quote from Wilson's *Lantern Journeys*—a work admirably adapted for such a purpose :—

"NIAGARA FALLS.—This is America's grand crowning glory. This magnificent work of nature is situated between lakes Erie and Ontario, and previous to allowing the water of the former to pass down and intermingle with that of the latter, it gives a course of lofty tumbling such as no other water in America ever gets. The fall has plunged for ages over the present site, pounding and pushing, and rushing and gushing in processions and in piles, manufacturing foam, spray, and music and rainbows *ad infinitum*. Niagara is quite as beautiful in winter as in summer, and those who have not seen it when the frost king is in power have still to witness much of the beauty and splendid glory of Niagara. Its stalactites and stalagmites of stupendous size, its splendid ice bridges, and the magnificent display of frost work upon the trees, make one think of the palace of Aladdin, if we may be so profane as to compare a work of imagination with such a splendid reality as this."

We have been prompted to give the above at length, because the exhibition of photographs by the lantern, on Monday, was far from being the only one at which we have been present when excellent pictures were exhibited under circumstances that deprived them of much of their interest. We rejoice to hear that lantern transparencies are now rapidly accumulating in the hands of photographers. We, therefore, urge upon each the propriety of numbering every picture before being admitted to form part of the general stock, and on one page of a MS. book, kept exclusively for the purpose, to jot down such particulars of each picture as shall form an instructive and interesting accompaniment to it when projected upon a screen. By having these notes numbered consecutively, and keeping the book and the slides together, no time would be lost in supplying reliable information on any picture selected for exhibition.

To those who may be yet undecided as to securing tickets for a chance in the Art-Union organised for aiding the funds of the Association, we may say that a larger and finer collection of really valuable photographs than those which adorned the walls of the hall on Monday evening, and all of which are to be included among the prizes, cannot be desired. In this Art-Union will be included more than five hundred prizes, varying in value from half-a-crown to seven guineas, the proportion of prizes to tickets being as one to seven. An advertisement referring to this matter will be found in the usual pages.

This first attempt in London to provide *matériel* for an agreeable "popular evening" has been attended with so much succes as to warrant our indulging in the hope that the experiment will be repeated at an early date by those who have so disinterestedly and ably managed the excellent entertainment to which we have drawn our readers' attention.

# Meetings of Societies.

## LONDON PHOTOGRAPHIC SOCIETY.

THE monthly meeting of this Society was held on Tuesday evening last, the 12th inst.,—Mr. J. Spiller, F.C.S., President, in the chair.

Messrs. W. M. Ayres and John Cuthbert Stenning were admitted as membrs .

Messrs. Heavyside and Murray were appointed auditors in anticipation of the annual meeting. The Chairman intimated that at the following meeting the election of officers and council would take place, and read the laws relating to the procedure to be followed in connection with the election. Notice was also given of an alteration, of a merely verbal and explanatory nature, to be proposed in one of the laws.

Mr. Spiller then vacated the chair (which was taken by Dr. Mann), and gave an explanation and demonstration of a new and very powerful light—a description of which will be found in another page. Mr. Spiller was loudly applauded, the experiment having been highly successful. Having announced that this subject would be taken up in detail at the March meeting, he (Mr. Spiller) resumed the chair.

Mr. George Hooper then read a long paper *On the Origin, Aims, and Achievements of the London Photographic Society*. It would be impossible to understand the short discussion which followed the reading of the paper unless the communication were previously submitted to our readers; hence at present we merely summarise what took place.

The CHAIRMAN (*apropos* of a proposal in the paper to obtain a royal charter for the Society to enable them to grant honorary degrees) said he was afraid that such a scheme must not be entertained by them under existing circumstances. The cost to the Society, if the charter could be obtained, would be far beyond what they were able to bear. He was equally of opinion that a room for meeting in Burlington House could not be obtained.

Mr. DAVENPORT (the financial officer of the Society) corrected Mr. Hooper with respect to statements in the paper relative to the formation of the Society. He observed that he had been connected with the London Photographic Society since its birth, and if he had to write its history it would be very different indeed from that to which they had listened. Referring to Mr. Hooper's claim that photography had been of much assistance to science, he observed that science had done more for photography than photography had for science.

Mr. BIRD did not think there was the slightest chance of their obtaining a royal charter. The improvements in photography had been effected by chemists and mathematicians, and these scientific bodies were already provided for in Burlington House. As well might the telegraphists put in such a claim. They would have no chance whatever if they applied to government.

Mr. W. N. HARTLEY (referring to the sectional divisions of the British Association) said that a sum of money had been granted to the late M. Claudet to investigate the value of gem lenses, for photographic purposes.

Mr. W. J. STILLMAN said that all the science that belonged to photography was borrowed from the chemists.

Some further remarks were made by Messrs. Pearsall, Hart, the Secretary, and others; and, after a vote of thanks to Mr. Hooper, whose paper we hope to publish, with comments, in our next, the meeting was adjourned.

## EDINBURGH PHOTOGRAPHIC SOCIETY.

THE third ordinary meeting of the session was held at 5, St. Andrew's-square, on Wednesday evening, the 6th inst.,—the President, Dr. Thompson, in the chair.

The minutes of the previous meeting were read and confirmed, and the following candidates were balloted for and unanimously admitted ordinary members :—Messrs. W. Hume, James Steele, W. Haldane, W. H. Davies, jun., Charles Robb, Richard Brown, John Weir, and A. Cormack.

Dr. John Nicol then read a paper on *The Progressive Results of the Past Session*. [See page 30.]

Mr. W. NEILSON said that Dr. Nicol was much too modest in his introductory observations. The paper was really an admirable *résumé* of the work of the year. He was not at all sorry that there was nothing new to record. It would be much better for the Society if the members would all try and bring something good rather than something new. He was sorry that there were many great guns who never fired a shot, just because they thought what they knew was too old. They should remember that the greatest temple was built of single bricks, and every man should contribute as many bricks as he could.

Mr. J. M. TURNBULL thought the introduction of Messrs. Ross and Co.'s symmetrical lens the greatest hit of the year. He should very much like, however, that a similar lens of much longer focus were introduced, as it would be of the greatest possible use, and hoped the firm would yet introduce one. The rotary burnisher, no doubt, did its work very well, but not better than any ordinary press with a hot plate. Photographers had in their possession the means of glazing their pictures before the burnisher was introduced if they had only taken the trouble to do it.

Mr. J. BASHFORD was much pleased with Dr. Nicol's paper, and should look forward to seeing it printed in the Journal, where it could be read at leisure. He quite agreed with Mr. Turnbull regarding the burnisher. It was a capital tool; but he had seen as good, if not better, work done by the ordinary press and hot plates. He had repeatedly tried the dusting-on process in reproducing negatives, and found it exceedingly simple; he considered it one of the greatest discoveries of the day. Not only could an exact copy of a negative be made, but a faulty negative could be vastly improved in the reproduction.

Mr. Alexander Mackay then read a paper entitled *Extracts from a Letter to a Young Photographer*. [See page 28.]

Mr. J. Ross (in reply to the Chairman) said that he agreed with every word Mr. Mackay had said, and especially with his observations on the advantage that a young photographer would derive from the study of art. This was no new view of his, as, something like a quarter of a century ago, when the firm of Ross and Thomson engaged an apprentice it was made a condition that he should as a pupil attend the school of art.

Mr. W. NEILSON complimented Mr. Mackay on his very excellent paper, and thought the recommendation to study in the art exhibitions could not be over-estimated. He certainly did not like to see a white face in a photograph; but the photographer who had to live by his profession could not always get things his own way. Some of his customers preferred a face that looked like an etching, without a trace of detail, and if he refused to make it for them they would employ some other person who was less scrupulous. Others of the public liked black faces,

and so Rembrandts had to be taken. So long as the public was paymaster the public must be pleased; and he thought that every effort should be made to elevate the public taste, so that nothing but good work would be tolerated. He could not say that he liked the so-called "Rembrandt" effects generally, although he must confess that he had seen some exceedingly fine pictures of that class.

Mr. A. Asher could not agree with Mr. Mackay in his estimate of the Rembrandt effects, if it applied to such as those which he (Mr. Asher) had laid on the table for the inspection of the members. They were principally of American production, and were characterised by the editor of the *Photographic News* in a letter (an extract from which he read) as "fair examples of the legitimate use of shadows and half-shadows." He would like Mr. Mackay or Mr. Ross to point out any defects that they might see in the specimens, and say how they might be remedied. He also took exception to the epithets "trash" and "vulgar," which had, according to the report in the Journal, been applied to the effects in question at a previous meeting of the Society.

Mr. Ross explained that he used the word "rubbish," and not "trash." (Laughter.) That word only applied to a certain class of Rembrandts.

Mr. Bashford said that Mr. Asher had mistaken his meaning. In his paper, read at the meeting referred to, he used the word "vulgar" in connection with the name, and not with the result itself. He could not say much in favour of some of the pictures on the table. The fact was that the effects were produced by a false reflected light—probably by the hand-screen introduced by Mr. Kent—and the result was the production of lights thoroughly untrue to nature. He could not agree with what had been said against retouching. The photographers' tools were not perfect, and a little retouching was often absolutely necessary to make their work as near truth as possible.

Mr. Neilson thought the pictures exhibited by Mr. Asher were very pretty, but nothing more; they were undoubtedly retouched, or so lighted that all texture was destroyed.

Mr. G. A. Panton thought the dislike of some members was more to the name than to the results, which, in his opinion, were very beautiful. They might not be like Rembrandt's work; but the name was selected as a matter of convenience, and any other one would have done as well. He should be very glad indeed if every member in the Society could produce work equal to that laid on the table.

Mr. Ross could not understand what Mr. Bashford meant by saying that retouching was necessary because of imperfect tools. Did ever anybody hear of retouching a daguerreotype? And yet a daguerreotype was the perfection of photography. He was extremely glad that its re-introduction had been recently recommended in influential quarters, and hoped that the recommendation would be largely acted upon.

The President considered the pictures on the table very fine specimens of what photography could do. Each old master had managed his light as he thought best, all arriving at magnificent results by different roads, and the same might be said of photographers. The one thing needful was the cultivation of the highest possible æsthetic education, and when that was accomplished there was no fear of the kind of work that would be turned out, no matter by what name it might be called.

Votes of thanks were given to Dr. Nicol and Mr. Mackay, and the meeting was adjourned.

## PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

The first annual meeting of this Association was held on Monday last, in the Co-operative Institute, Castle-street, Oxford street,—the Rev. F. F. Statham, F.G.S., presiding.

There was a large attendance. On the table were exhibited cameras and microscopes, and on the walls of the room were exhibited a large number of photographs by the best artists.

The Chairman briefly directed attention to the nature and scope of the Association, and called upon the Secretary to read the

### REPORT.

In presenting this, the first, Report of our labours on your behalf, we trust that a short account of the establishment of the Photographers' Benevolent Association will be of interest to the members and photographers.

It is now nearly eleven years since Mr. A. H. Wall read, before the South London Photographic Society, a paper upon a provident fund for photographers, in which he urged upon the profession its desirability and pointed out the benefits which would accrue from such fund. To judge from the published report that meeting was unanimous in the opinion that such an association should be formed; but, after a correspondence in the journals, the subject was dropped. Since that time it has cropped up again at various periods, being forced upon the attention of the profession by the record of details connected with the sufferings of brethren in distress.

In 1868, during the usual discussion, a well-known gentleman—Mr. Matthew Whiting—made some excellent suggestions, and offered the sum of £50 if an association were started within six months. Other sums of money were promised from various parts of the country; but still there was nothing done. As usual, the correspondence bristled with suggestions as to what others must do; but every one was afraid to take the initiative, and again the matter was dropped. In the spring of 1873 the subject was again broached, and, entirely upon his own responsibility and without any plan cut and dried, the present Secretary called a meeting at his house, in Brixton, which was attended by about thirty assistants. Money was subscribed for preliminary expenses, and a Provisional Committee formed to consider the form the Association should take and to call a large meeting at some suitable place in London. An aggregate meeting was held at the Arundel Hall, which was largely attended. The Provisional Committee submitted two schemes for consideration—one based upon the rules of the Foresters' Benefit Society, the other the form subsequently carried out. After an animated discussion the constitution we have the honour to represent was adopted; the Provisional Committee was enlarged, and power given to add to their number. Since that meeting the Board of Management has been formed, and is working harmoniously together to establish the Association upon a secure basis.

The earlier meetings of the Board were held at the residences of the various members. Then Mr. Ganly, late deputy-chairman, gave the use of a room at 174, Fleet-street, and when he left arrangements were made to meet there regularly, the charge for the use of the room being five shillings per night.

Hypercritics may be disposed to sneer at the expenditure in comparison with the receipts; but let it be borne in mind that the expenses would not have been larger if the income had reached ten times its present amount. The Board of Management takes to itself great credit that the Association has been established at an expenditure which will bear comparison with the cost of establishing any similar association.

To photographers and their assistants the credit of the income belongs; and as the Association is now established it ought to be the pride of the profession to see that the income is always large. The desire of the Board of Management will be to keep down expenses as regards working; but there will always be a desire to meet any application for relief in time of distress. They have only yet had one application for relief, and, after due investigation, the applicant was awarded five pounds. Among other benefits accruing from membership that of the employment register will, it is expected, ultimately be a very useful feature.

In conclusion: the Board of Management appeal to photographers to aid them in their labours. Employers might send donations, and use their influence in inducing their *employés* to join. Assistants, male and female, are urged to become connected with the Association, and to help to make it thoroughly representative of this important profession.—W. T. Wilkinson, Hon. Secretary.

| *Dr.* | Balance Sheet. | | *Cr.* |
|---|---|---|---|
| Donations | £49 10 8 | Printing and stationery | £27 1 5½ |
| Members' subscriptions | 14 19 0 | Relief of an applicant | 5 0 0 |
| | | In London and County Bank | 28 13 6 |
| | | Cash in hand | 3 14 8½ |
| | £64 9 8 | | £64 9 8 |

The report and balance sheet were adopted.

The election of officers was proceeded with, and the whole of the former officers were elected, with the addition of Mr. J. Skinner as deputy-chairman, and of Mr. M. P. Tench as a member of the board of directors.

The proceedings terminated with a musical entertainment and the exhibition of a large number of transparencies by the agency of the lantern.

## Correspondence.

Meeting of the Photographic Society of France.—Scenographic Apparatus.—M. Geymet.—Parallelism.—Sea-weeds.—Coloured Enamels.—Lecture on Astronomy and the Transit of Venus, by M. Wolf, of the Observatory of Paris.

The Photographic Society of France held its meeting on Friday last, the 8th inst.,—M. Balard in the chair. The meeting was well attended.

After the presentation of new members and the reading of the correspondence,

M. Deyrolle asked permission of the Society to present a newly-invented pocket apparatus for its approval, which the inventor (M. Candeze) had named the "scenograph." The members looked about and sought for the instrument in question, and it caused much merriment when M. Deyrolle took it out of his pockets piece by piece. I will not dwell on this little instrument, for I fear it is too small to render much service to photography. It is a pretty little plaything for children. It may, perhaps, give some young men a desire to dabble in photography; therefore let us give it a welcome.

M. Geymet then presented to the Society about 300 proofs printed by his photolithographic process as a gift to the readers of the Society's *Bulletin*. M. Geymet then laid before the members a few proofs of his phototypic process, which he proposed to the members for adoption, and to lay aside silver printing, which was expensive, tedious, and not permanent. He said that 300 proofs could be made daily. To judge by those laid before the meeting great progress has been made. One of them, the portrait of a young lady, was very harmonious, the half-tones being transparent; indeed, many photographers would be at a loss to say whether the proofs were made on salted paper or not.

A communication was read from M. Huguenin, who gives to the public what I must say is a very elaborate system to find parallelism when reproducing steel-plate engravings, maps, &c. In the first place, he says, "it is necessary to have a good objective." This remark was received with laughter. His letter being very long I cannot give it

in full. The author seems to imagine that he has discovered a method to overcome what he supposes to be an unconquerable difficulty for the photographer; but, happily, I know from experience that such is not the case.

In the hope that the system I formerly employed may be of service to some of the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY I will endeavour to describe it, although I doubt whether such an easy system is not already known on the other side of the channel; indeed, I should not have dared to write on the method of securing parallel lines had not many set it down as a difficulty in photography, and as the French proverb says—"*L'occasion fait le larron.*"

Stretch the map or engraving on a plate of glass; fix it perpendicularly with a plumb-line on the easel or stand; take two pieces of twine and cross them over the engraving (thus ✕) from corner to corner. The centre is now found. Draw up the camera to its proper place; put on the cover or cap of the lens, in the centre of which there is sometimes a small knob; and tie to this knob a piece of thread, the other end of which must be attached to the centre of the twine crossing the engraving. It will now be easy to see if the line formed by the thread is horizontal or not; raise or lower the camera till it is horizontal, taking care at the same time that the camera itself is perfectly upright. Take the cap off the lens, and very little trouble will be found in focussing.

Another method which I employed, and which I prefer, although it requires a little more skill, is as follows:—After having fixed the twine across the engraving as in the first operation, take two common playing cards—say the King and Queen of Spades—and, with a pair of scissors, cut a slit half-way across each card; then slide them into each other, and they will take the form of a cross (+). Now glue this on the twine exactly where it bisects the other at the centre; focus the engraving, and if the portrait of the king or queen is seen the camera is not in its proper position. When a sharply-defined cross only is seen on the ground glass it is certain that the lines are parallel.

M. Steinfort, of Brest, presented to the meeting for examination a collection of sea-weed, and at the same time requested the members to inform him where proofs could be obtained at a moderate cost for a large publication. I am not aware whether he has succeeded; but I think M. Leon Vidal's process of photopolychromy would answer the purpose very well.

MM. Gougenheim and Forest then presented some beautifully-coloured enamels obtained by their process. They promised to give a description of their manner of working, and to bake some specimens in the presence of the members at the next meeting of the Society.

M. Wolf, of the Observatory, was then called upon by the President to deliver his lecture, of which I give a rather full report:—

YOUR committee thought it would be agreeable to you to have presented to you some details of the astronomical observations which have lately taken place on so large a scale in connection with the transit of Venus, and in which photography has been called upon to play a most important part.

Although informed of your desire rather late, I nevertheless accepted the instruction with pleasure, for two reasons:—First, because it offered me an occasion to express my gratitude for the honour you have done me in naming me an honorary member of your Society. Secondly, because I believe it will be useful to astronomical science that enlightened and experienced men be kept *au courant* with its indispensable requirements, in order that, with your acquired knowledge, you can come to the aid of astronomers, who are, in general, unacquainted with the delicate manipulations of your art. I propose, then, to speak to you in a general manner of the application of photography to astronomical observations, and particularly of the applications of it made during the late transit of Venus.

The science of astronomy as applied to observation has a double object in view:—Firstly, to study the physical character of the heavenly bodies, define their forms, and discover their constitution. Secondly, to determine at each instant the position of the heavenly bodies in their relation one to the other.

The study of the first requires large and costly instruments; that of the second demands instruments distinguished above all by their stability and precision. I am happy to say that France has no reason to envy any other nation in this respect. During many years the optical instrument and the eye were the only resources the astronomer had at his disposal. This was the cause of numerous errors. The astronomer called photography to his aid, and thereby hoped to completely supersede the observer. For example: in all the stations for the observation of the transit of Venus the astronomer was replaced by a dry plate, which received an impression at every stroke of the clock—an electrical contrivance opening a trap and registering, mathematically, the position of the two spheres. This succeeds very well as regards the sun; but it is necessary not only to observe that great luminary, but to study, as well, the planets and stars, even in bright daylight.

The great stumbling-blocks to photo-astronomical observations are—Firstly, we are not yet in possession of films sufficiently sensible to take large pictures of the planets, or our instruments are not powerful enough. Secondly, an easy and convenient process has not yet been discovered, and it is impossible for the astronomer to dabble in the preparation of wet plates; it is imperative for him to have dry plates at his disposal.

The difficulty is not so great when we employ photography for the physical study of the heavenly bodies. Our telescope can follow those orbs and thus the time of exposure can be lengthened; nevertheless, it is better to shorten the exposure as much as possible. Very excellent results have been obtained, as the members can see by looking round the room, on the walls of which are suspended some magnificent proofs of the moon. As for the planets, their reflected light is too feeble to permit us to enlarge their image; but, as to the nebulæ, it is impossible to think of photographing them, their light being green as seen through the spectoscope, and therefore non-actinic. In photographing the sun the time of exposure must necessarily be short, and therefore it is possible to enlarge the image direct from the telescope.

Instead of employing a large instrument pointing to the sky M. Foucault thought it would be preferable to place the telescope in a horizontal position, and by means of a siderostat (a kind of heliostat) reflect the heavens before the observer without his being obliged to change his place or remove his telescope. Foucault left a model of a regulator and the calculation for a mirror plane; and if the Observatory of Paris possess a magnificent instrument of that kind it is owing to the efforts of M. Martin, who is able to construct an irreproachable mirror plane, which Gambey and Arago declared to be impossible.

The photographic observation of the sun differs very much from ocular observation, and cannot replace it altogether. The influence of the atmosphere is one of the greatest obstacles. The eye of the astronomer receives a series of images, good or bad, and by uniting the good the observer can form a conclusion as to the truth of the observation. The dry plate, however, gives an exact representation of the source of light at the moment of exposure. If atmospherical influences are propitious the proof is good; but, alas! numerous are the failures. Dr. Warren De la Rue has informed me that only one per cent. were good. The astronomical photographer does not require less patience than yourselves when you desire to take the portrait of a restless child, or in the reproduction of anything difficult in your art.

I take the occasion to submit a series of proofs of the spots on the sun. These negatives were taken at the Observatory of Paris, on the dry plates of Professor Stebbing. [The readers of this communication will appreciate my silence as to the flattering observations here expressed by the distinguished astronomer. As they were, however, addressed to me, I am nevertheless in duty bound to thank him.]

To sum up: you can see that till within the last few months photography could render but feeble service to astronomy. It could only be employed in the daily study of the sun's spots, and the observation of the clusters of stars, in selenography, and the observation of eclipses.

The transit of Venus has opened up a wider field. An occasion has here been given to photography to show what it can do in another branch—that of astronomical science—involving the highest precision, and where it will have to compete with the most exact methods of observation known and the most delicate results of theory.

The object which astronomers have had in view in the observation of the above phenomenon was to measure the distance of the sun from the earth. The interest involved in advancing the knowledge of this is immense. The map of any country or region, or the plan of any building, would be of no service if we were ignorant of the scale on which the map was drawn or the house to be constructed. As it is with regard to the map and house, so is it as respects astronomy. The observation of the celestial bodies permit us to construct celestial globes, maps of the heavens, &c.; but it cannot give us the absolute size and distance of those bodies until we can have the unity of length. Then we can construct plans in relief which are the exact representation of the size, form, and distance of the heavenly bodies.

Why do we take the distance of the sun from the earth as the type of unity? Because the planets revolve round the sun at a distance which is *en rapport* with the length of the revolution of each of them. This length is expressed in terrestrial years the same as the distance of each of them from the source of light.

| Mercury. | Venus. | Earth. | Mars. | Jupiter. | Saturn. |
|---|---|---|---|---|---|
| 4 | 7 | 10 | 15 | 52 | 95 |

If one of these quantities were exactly known in yards or metres, by simple proportion we could infer the size of the others. To measure the distance of the sun from our planet is to know the size of the universe. The legitimate hope that this problem would be solved in an indisputable manner was sufficient to justify the zeal, vast efforts, and ardour with which on all sides preparations were made to observe the transit of Venus.

France, I am happy to say, has never been behindhand in these interesting questions. She was the first to apply herself to securing precise measurements of the meridian in the seventeenth and eighteenth centuries; and, notwithstanding the severe losses she sustained in the last war, several expeditions were fitted out in order to add their mite to universal science. I am happy to quote the testimony of one of our brethren on the other side of the channel, Sir George B. Airy, the Astronomer-Royal of England, who, when delivering a lecture at Ipswich, spoke as follows:—

"The first expedition for this purpose *(la mesure de la tere)* was made by the French Government, under the kings of France; and all honour be to the French for the part they took in this matter! Many of you are aware

that Guizot, the late Prime Minister of France, before he was appointed minister of the crown was professor in one of the French colleges. He gave lectures on the history of civilisation, and he maintained that France had been the great pioneer in science, and that civilisation generally had originated in France. I believe that, in matters of science, it is as stated by Guizot. When the question of the figure of the earth came to be debated, two celebrated expeditions were made under the auspices of the French Government—the first great scientific expeditions ever made in the history of the world."

After passing several projections before the eyes of the members, he (M. Wolf) then gave a long description as to how the distance was to be measured. By the angle under which we see an object of a known size (said he) we are enabled to judge of its distance. In time of war general officers can very readily judge of the distance which separates them from the enemy by the angle under which are seen the men forming the battalion. In like manner we measure the angle to judge of the distance which separates us from the source of light and life.

The measure of the earth is the base for taking the measure of the size of the universe. The passage of Venus over the disc of the sun permits us to take that angle under most favourable auspices at the moment in which the centres of the three orbs are in a straight line one with the other. Venus is seven-tenths of the distance of the earth from the sun according to the law of Kepler.

Let us place at the moment of the eclipse two astronomers at different positions on the earth's surface at the extremities of the terrestial diameter. Venus will be seen by the two observers at two different points on the sun's disc, and the distance of these two points will be the seven-thirds of the earth's diameter. If we look at this distance we shall see it at an angle equal to fourteen-thirds of the solar parallax; that is to say, the angle under which the centre of the sun is seen is the half of the earth's diameter. Venus, in reality, does not remain stationary, but crosses over the sun's disc, forming a "chord" from east to west. The distance of the two "chords" seen by the two spectators is the distance which must be measured.

It is here necessary to remark that astronomers possess other means of determining the sun's parallax; but the observations of the transit of Venus will give a better result, or it would have been useless to have gone so far in order to observe it.

Here the learned astronomer described the passage of Venus by the aid of very simple mechanism in the glass slide of the lantern; referred to the requirements of astronomy, and spoke of the difficulties to be encountered—how an error of 0″02 in the parallax would correspond to an error of 0″06 in the distance to be measured. The diameter of the sun being 32′ or 1,920″, 0′06 is, therefore, the 32,000th part of the sun's diameter.

The texture of collodion is not fine, and this depends more or less on the process employed. Wet collodion is very bad. Dry plates present the greater number of advantages. Being always at hand, easily taken from place to place, a minimum quantity of dust, and no blurring, they give a truer image of the sun than wet plates. The centre of the negative image is dark, and it tones down lighter and lighter towards the edge, thus giving the true spherical form of that globe. This may, perhaps, be accounted for in the time of exposure.

Great precision is required in astronomical photography. It is necessary not only to have sharp, clear definition, but it is also imperative that the film preserve the image, and that the developing solution neither contracts nor expands the collodion. Some say that it does this; others that it does not. Experiments were made by Mr. Rutherfurd and Dr. Vogel, and it is the opinion of these gentlemen that the contraction of the collodion was not to be feared if there were a substratum of albumen on the plate. But no absolute certainty exists that an accident may not not occur; for that reason M. Martin proposed the employment of daguerreotype plates by the expeditions sent out by France. Although slower they give sharp definition to the edge; there is no contraction or expansion to be feared; they possess a perfectly plane surface, and are very easy to prepare.

The French Commission sent out horizontal telescopes 3m. 56in. in length, in order to have an image 6 c.c. M. Martin manufactured the mirrors for the siderostats. That gentleman also made a similar one for Lord Lindsay. In order to determine photographically the instant of the contact M. Janssen invented a revolving disc, upon which segments of the two orbs were photographed at every beat of the electrical clock.

M. Wolf then read the telegrams received from the observers, at the several stations, sent out by the different governments, and informed the members of the results obtained. He expressed his regret at not having yet received any information from Lord Lindsay; but spoke in high terms of that gentleman, of his great love of science, &c. He (M. Wolf) summed up by saying he was sure that important results had been secured, and that it was certain that photography had rendered great service to science, it being the first time its aid was sought for obtaining precise astronomical measurements; and he hoped that, when put to micrometrical proof on the return of the expeditions, it would not be found wanting.

3, *Place Bréda, Paris, January* 12, 1875. E. Stebbing, *Prof.*

## "THE NEW LENS."

*To the* Editors.

Gentlemen,—A very few brief remarks from me must suffice as a final rejoinder to the letters in your columns on the subject of my patent lens and the infringements thereof. I have neither the time nor the inclination for a discussion which can decide nothing.

My action in regard to the former correspondence referred to by Messrs. Murray and Heath is easily explained. At that time I had reason to believe that Messrs. Steinheil were infringing my patent, and I intimated my intention of obtaining an injunction, when, on the mediation of a common friend, Dr. van Monckhoven, I was induced to leave the matter in abeyance.

The publication to which Messrs. Steinheil refer gives them priority for the construction of a system of lenses the combinations of which are respectively composed of two *separate* elements, viz., flint and crown, not cemented. I still maintain that their "new lens" is an infringement of my patent; and whilst I admit the courtesy of their tone, which I should wish to reciprocate, I cannot concede legal rights which, I am assured on the best authority I can obtain, are valid.

To conclude: no one will dispute the dictum of Messrs. Murray and Heath to the effect that if a thing is "uncalled for" it is "unwarrantable;" but as I have made no attack, but simply pointed out, in reply to a "leader," an infringement of my patent, their charge is quite uncalled for.—I am, yours, &c., J. H. Dallmeyer.

19, *Bloomsbury-street, London, W.C., January* 13, 1875.

## DR. NICOL AND *NOTES FROM THE NORTH.*

*To the* Editors.

Gentlemen,—I have just seen for the first time Dr. Nicol's remarks on a case in which I am pursuer, and of which I may say *magna pars fui.* For very sufficient reasons it is still *pendente lite;* and, if your correspondent had only exercised a little judicious reticence till the case was closed, I would have been delighted to be advertised in your columns by him, even supposing I were unnamed.

To describe me as a "Leith photographer" is strictly true, and to mention so kindly that I do "high-class work at low prices" is only what the veracious daily press affirm and my numerous customers corroborate. But to go on stigmatising me as "an unfortunate photographer" is a kind of advertisement surely self-contradictory and non-historical, seeing I had the unsought honour thrust upon me of being proposed and seconded, once on a time, as an honorary member of the Edinburgh Photographic Society! *Si monumentum quæris circumspicere.*

When the astute trader in human hair and gullibility wished to dispel all doubt from the public mind that his unctuous compound really came from the North Pole, he put a large placard in his window—"A bear lately killed;" but one would have liked to have seen his bills of lading and his "notes from the north," and to have counted the cold, white skins of the unfortunate victims to "the only genuine bear's grease." And when Madame Rachel assured her votaries that her celebrated elixir "was brought across the desert on the backs of swift dromedaries to the court of Teheran," we long as much to see even one swift dromedary as to know the exact spot where the "rock dew" was distilled.

The frequency with which Dr. Nicol introduces a certain Edinburgh firm has been remarked by your readers. He cannot even narrate this case without bringing "our friend Mr. Ross," and the "ability of Mr. Ross" in a non-photographic question in strong contrast with your humble servant, who is represented as using the machinery of the law "in extracting the guineas from the pocket of his unappreciating customer."

When I frankly gave Dr. Nicol a full and confidential narrative of the whole case I was not a little surprised at the *ex parte* and personal bias he has given to it. I did not expect that he would make the matter public, before the case was decided, without my consent. What he finds convenient to omit I will endeavour to supply.

The painting measures 36 × 28 in., three-quarter figure, and framed in five-inch *gilt* moulding—the price, *including frame,* £13 13s. Mr. Ross, in his report, considers £6 6s. "ample remuneration for the work done." The artist is well known and of acknowledged good standing, and commands numerous commissions from some of the best photographers in Edinburgh, Glasgow, St. Andrews, and the north of England; and so well pleased was I with the work that I paid him ten shillings above his usual price. The difficulty of a likeness may be inferred from the fact that he never saw the lady, the *carte* from which the enlargement was taken having been taken twelve years ago. The painting was altered by desire.

When the case came up for adjudication I was prepared to tender evidence as to quality and price, and I was so satisfied with both these points that I was indifferent who the referee might be. I, accordingly, concurred in the appointment of Mr. Ross. Dr. Nicol assures your readers that "he was equal to the occasion." That is not, however, the opinion of both the agents in the case; for they are now at loggerheads as to the interpretation of Mr. Ross's answer to the remit from the court—the one maintaining the frame is included in the £6 6s., and the other the reverse. In this dilemma, and to prevent hostilities, I wrote to Mr. Ross to clear up the point; but no answer was returned.

Ungrudgingly we all delight to see that gentleman lying on the easy oars of a well-earned professional reputation, and it is no disparagement to him if judicial aptitude and self-possession were not forthcoming in untried circumstances as on this occasion. Want of experience and physical temperament may, to a large extent, account for it. Meantime

I will be most happy to show the portrait and *carte de visite* to any artist or photographer on presenting his card.—I am, yours, &c.,

*Leith, January* 13, 1875. A. W. Steele.

## EXCHANGE COLUMN.

The British Journal of Photography from August 13, 1869, to April 10, 1874, in exchange for anything useful in photography.—Address, P. J., Post Office, Alford, Lincolnshire.

The British Journal of Photography, in weekly parts, with indexes complete, all clean and perfect, for 1872, 1873, and 1874, will be given in exchange for a Howard's tent, *carte*-rolling press, or 1-1 water-tight glass bottle.—Address, D. Breare, Moor-lane, Burley-in-Wharfedale.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

J. M. Turnbull.—Received. Report in our next.

Developer.—See formula No. 4 on page 174 of our Almanac.

W. J. M.—A good lens of thirteen inches focus will easily cover a 10 × 8 plate.

In Type.—Communications from G. W. Webster, F.G.S., Edward Dunmore, and others.

Veritas—The principle of the instrument is excellent, but it was very imperfectly carried out in practice.

Barium.—You may obtain the information by making a simple and inexpensive experiment, for which you have more time than we have at present.

Amateur (Croydon).—If you immerse the glycerine plates in water for a few seconds the developer will then flow quite smoothly over the surface.

Hamlet.—If you mix a little aniline dye with ordinary negative varnish, and apply this to the faded gilt work, you will be surprised at the rich effect which will be produced.

J. Boardman.—The method of reproducing negatives by the "dusting-on" process is not patented or protected in any way; hence you are at liberty to practice it to any extent.

E. S.—The print received is indeed a very "fair production," and attests your skill in taking a landscape, as well as the efficacy of the carbonated paper in preserving the purity of the whites.

Smiddam.—If the portrait forwarded be a fair specimen of the effect obtained by your method of lighting, the top light predominates. But, although unacquainted with the construction of your studio, we feel certain that far better results may be produced in it.

Cadmus.—If we are not mistaken the size of the condensers used by the gentleman named is four inches. Those at the public institution referred to are much larger. The mixed gas burners are used.

H. P.—We have received two letters respecting the pantascopic camera, about which this correspondent made inquiry. We shall be glad if he will send his name and address, as his letter has been destroyed.

G. F. A.—The fault lies in using acid at such a temperature. Bear in mind that by allowing the cotton to be immersed for a considerable time in weak and cold acids the collodion made from such pyroxiline will be strong and tough, and be admirably adapted for transfer purposes.

Rev. J. B.—It is out of our power to answer your first query, unless we are made aware of the focus of the lens and the exact size of the picture. Grenatine is only gelatine that is quite soluble in warm water; indeed for every purpose in photography ordinary commercial gelatine will answer just as well as grenatine.

G. G. T.—Not having time at present to try your paper we handed it to a printer, who has reported as follows:—"Very bad—quite unfit for photographic purposes. It gives pictures covered all over with spots, and refuses to tone." If you steep it in water so as to effect the removal of the albumen it may be utilised as writing paper.

Nobody.—1. They are printed by the negative-albumen process, and are toned in a "hypo.-and-gold" toning bath.—2. Permission will have to be obtained before you can copy any of the pictures.—3. "Reigate, Surrey," is all the address required.—4. The reply of Messrs. Cassell, Petter, and Galpin seems to be conclusive.—5. We shall make inquiry and send a private letter.

Hypo.—Our opinion respecting lime being the cause of the spots is rather confirmed than otherwise. Probably your printer, before using the lime-toning bath, merely decanted the apparently clear solution instead of filtering it. Had the spots been due to the preparation of the *paper* the mere changing of your printer would not have effected the cure which followed such a step.

G. O'F.—The publisher may certainly prohibit you from copying by means of photography or otherwise the illustrations in the book of travels named, so as to prepare lantern transparencies; but he cannot prevent you from exhibiting, by means of the "opaque lantern," the pictures themselves. These you may tear out of the book, and mount and colour them in any way you think proper.

G. F. J.—To mend the negative proceed as follows:—Obtain a little Canadian balsam of very fluid consistence, and, having applied a little to the edges of the fractured pieces, provide a plate of glass the size of the negative; lay it flat down on the table, cover it with a sheet of tissue paper, and on this lay the pieces of the negative, face uppermost. Press the pieces into intimate contact with each other, and allow the whole to remain undisturbed until the balsam has become hard, which, if a gentle heat be applied, will soon be the case. By means of a tuft of cotton made wet with benzole or turpentine remove all the superfluous balsam from the surface of the negative; for, in pressing the fragments into contact, some of it will have flowed out.

One in the Trade.—It has been said by Mr. Bolton, an American experimentalist, that the most sensitive of all the uranium salts is the citrate of uranium and ammonia. First obtain a precipitate by adding ammonia to a solution of nitrate of uranium, and wash this in a few changes of water. Next dissolve a small quantity of citric acid in water—the quantity and strength not being of consequence—and having divided this into two parts saturate one portion with ammonia and the other portion with the yellow uranium precipitate. Then mix the two, and evaporate to dryness.

The Fraud by a Photographer.—John Fahrbach, 52, described as a photographer, who was found guilty at the previous sessions of having, on the 13th September, obtained £265 by fraud from a German named Julius Hartmann, was brought up for judgment at the Liverpool Court of Quarter Sessions. It will be remembered that the prisoner engaged Hartamnn as secretary to the Liverpool and London Photographic Company, and, by means of false representations respecting the company, induced him to deposit the sum named as security, which he (the prisoner) afterwards converted to his own use. The Recorder postponed passing sentence last sessions in the hope that the prisoner or his friends might in some way make restitution to Hartmann, which it was then stated might possibly be done. Nothing, however, had been done in the matter. The prisoner was again brought up before the Recorder on Saturday last, the 9th inst., when Dr. Commins, on the part of the prosecution, stated that the prosecutor had left the country penniless. The Recorder said the prisoner had been convicted of one of the most cruel frauds he could imagine. He was reported by the London police authorities to be one of the greatest scoundrels alive, and he (the Recorder) would now give him the heaviest sentence it was in his power to give. The prisoner was then sentenced to five years' penal servitude, the term to date from the last day of the November sessions. Fahrbach, we may observe, is better known to many of our London readers by the name of A. E. Ceileuz.

Death of an Old Photographic Worthy.—The death of Mr. John Atkinson, of Manchester-street, Liverpool—so well and long known in connection with our art-science—took place on Saturday last. "Honest John," by which designation he was so well known among the fraternity, commenced in photography as an amateur; but, being an intense lover of the art, he soon made himself known by the enthusiastic way in which he overcame every obstacle which lay in the path of the elder workers in the photographic field. His occupation in the early part of his business life caused him frequently to visit the continent, and his friends giving him commissions for the purchase of materials suitable for photographic purposes formed the first step in prompting him to commence the present extensive business, which has been familiarly known throughout the world for nearly half a century. In earlier years, he was one of the first to introduce to the medical profession electro-magnetism as a curative power, and in many other ways Mr. Atkinson was an enthusiastic promoter of science. His extensive photographic establishment bears witness to his persevering, consistent, and honourable course of conduct, and it is as well known on the continent, the United States, and throughout the British colonies as it is in this country. Through his exertions as a pioneer he has been the means of introducing to the British public many, if not all, the leading foreign photographic novelties. Mr. Atkinson died at his residence, Frederick's Villa, Huyton, near Liverpool, on Saturday last, the 9th inst., after a brief but painful illness, at the advanced age of seventy-three years. He retired from business about nine years ago, and it is stated that ever since his retirement his health has been in a very critical condition. The business has been, and continues to be, carried on by his son, Mr. J. J. Atkinson, with the same characteristic energy displayed by his late father.

## METEOROLOGICAL REPORT,

*For the Week ending January* 13, 1875.

Observations taken at 406, Strand, by J. H. Steward, Optician.

These Observations are Taken at 8.30 a.m.

| Dec. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 7 | 30·07 | SE | 41 | 42 | 43 | 41 | Dull |
| 9 | 30·16 | SE | 39 | 41 | 44 | 39 | Dull |
| 8 | 30·04 | S | 41 | 42 | 46 | 40 | Dull |
| 11 | 29·84 | SW | 46 | 47 | 50 | 40 | Dull |
| 12 | 29·92 | SW | 45 | 46 | 50 | 44 | Raining |
| 13 | 30·08 | SW | 47 | 47 | — | 45 | Cloudy |

## CONTENTS.

# THE BRITISH
# JOURNAL OF PHOTOGRAPHY.

No. 768. Vol. XXII.—JANUARY 22, 1875.

## A COMBINATION GRAPHOSCOPE.

At the close of Professor Tyndall's lecture on some acoustic problems, at the Royal Institution, on Friday last, there was exhibited in the library, by Messrs. Murray and Heath, two graphoscopes which demand notice.

Premising that the ordinary graphoscope is so well known to the reader as not to require any description, we may say that Mr. C. J. Rowsell, its originator, has modified it to such an extent as to permit its being used in the examination of transparencies as well as of the ordinary pictures on paper hitherto employed in connection with the instrument. We would not for a moment have it supposed that we look upon any instrument for viewing pictures by both transmitted and reflected light at the will of the spectator as a novelty. The ordinary box stereoscope, with the little door in the front, is really an instrument of this kind; and the alethoscope of Ponti, of Venice, intended for viewing pictures of large dimensions, is also an instrument of a similar character. Hence, as respects novelty of general *principle* in the combination graphoscope of Mr. Rowsell, we are not able to point to any, nor, we imagine, is there any claimed, the chief features being some speciality in the mechanical construction by which its conversion for viewing either opaque or transparent pictures is rendered very easy and effective.

The instrument, as we saw it on Friday, appeared like a Kinnear camera with bellows body, a bi-convex magnifying glass of large size being placed in the front board instead of the usual photographic lens, and a transparency printed on waxed paper being placed at the wider end where the ground glass is usually situated. The crowd in the library was too great to permit of our making more than a cursory examination of the graphoscope; but on one or two points connected with or, rather, suggested by it we shall make a few observations.

The large lens of graphoscopes is usually a non-corrected double convex. There are two kinds of distortion inseparably connected with the use of a large and powerful glass of this description—the distortion of achromatism and that of projection. With regard to a certain class of subjects, the former is a positive virtue and the latter innocuous. The "certain class" of subjects refers to the very attractive and somewhat strongly-coloured photographs of flowers, which, when mounted upon a large card, form such effective objects for the graphoscope. Many, even among scientific men, are struck with surprise to find that although the picture, with the lens through which it is viewed, is strictly monocular the effect is stereoscopic; and they ask—Why is this?

When coloured objects, such as the gaudily-painted flowers to which we have referred, are examined through an uncorrected lens, owing to the different refrangibility of the coloured rays these rays will reach the eye under such varying angles of convergence as to make blue-coloured objects appear to be much farther away from the eyes than red objects, the intermediate colours of the spectrum appearing in an intermediate degree. Now to apply this principle. If a photograph of a group of flowers be photographed on a white ground, the most prominent centre flower being coloured a very strong red, some others farther from the centre, and of less importance as respects the composition, being respectively yellow, blue, or violet, the leaves being green, it will be found that, when viewed through a simple magnifying glass of the graphoscope order, in proportion as the colours are more or less frangible so will be the apparent distance from the eye of the objects thus coloured. The red central flower will stand out in bold relief, the green leaves will range farther back, while the blue or violet flowers will retire farthest back of all. Thus the very defect of the common graphoscope objective forms its chief merit when used in the examination of objects of the class of which we have spoken.

The defect of non-achromatism, which conduces so very much to the value of simple lenses when used in the examination of coloured pictures of flowers, is quite fatal to their value as a medium through which to examine a transparent photograph of a landscape, a scene in nature, or an architectural elevation. In pictures of the latter class, especially, is the effect offensive; for, owing to the aberration of the lens, the picture is shown in a sadly-pincushioned shape. This kind of distortion is the result of using a double convex glass as the "objective" through which the examination of the picture is to be made. A lens of plano-convex or of slightly meniscus form proves a palliative, if not a remedy, for this evil. But, if the lens be at all powerful, then the chromatic aberration will cause everything to be fringed with the colours of the rainbow, which, in the case of an uncoloured photograph, is objectionable in the highest degree. It amounts, therefore, to this—that while for examining highly-coloured pictures of flowers a bi-convex simple lens is best, for viewing uncoloured photographs, whether as opaque or transparent pictures, a lens that is non-distorting, both in respect to achromatism and projection, is indispensable. It was our intention to have here referred to an excellent and suggestive article on an analogous subject in our current Almanac by Professor Piazzi Smyth; but, after mature consideration, we have resolved to defer special reference to it till a future occasion.

Leaving the optical, we now speak of the photographic, requirements of the transparency-graphoscope. The preparation of pictures for this purpose is far, indeed, from being difficult. One main feature of difference between a print upon plain and one upon albumenised paper is that the latter is brilliant and upon the surface, while the former has a dull and sunk-in appearance. But, when looked *through*, the print on albumenised paper appears rather thin and poor in comparison with that on plain paper, which is usually bold and vigorous when examined in this manner. To produce transparencies, therefore, for the graphoscope or any other kind of photo-dioramic instrument by whatever name known, all that is required is to select a sheet of plain paper of homeogneous quality, salt it by immersion in a weak bath of chloride of soda or other chloride, when dry sensitise it on a nitrate-of-silver bath, and print to such a depth as to obliterate all but the highest lights when looked at in the usual way.

A picture when printed in this manner, fixed, and rendered translucent by waxing, fulfils all the requirements of a transparency of the highest order, when such transparency is to be placed during examination at a distance of from eight to fifteen inches from the eye. The method of producing transparencies just indicated will,

we feel assured, prove both better and easier than the printing of them on iodised paper with a subsequent development of the image by gallo-nitrate of silver. Since commencing this article we have tried both methods, and much prefer the simpler, as being also the better of the two methods.

We are at present unable to offer any opinion upon Mr. Rowsell's new combination graphoscope from the "patent-invention" point of view, as we are not yet aware *what* he has patented. This both we and our readers will learn in due course.

## ON PHOTOGRAPHIC PAPER.

We recently had an opportunity of examining very particularly, step by step, the manufacture of paper as carried on in one of the largest mills in the country. Our object of course was to obtain sufficient information to enable us to answer the question so frequently put—Why are we altogether dependent on two foreign makers for our supply of photographic papers? For this purpose we were fortunate in having as our guide the proprietor, who, in addition to being a thoroughly theoretical as well as practical paper-maker, is also an enthusiastic amateur photographer, and consequently perfectly understands the required conditions and properties which a good photographic paper must possess.

Our readers are, doubtless, well acquainted with the process of paper making, but we nevertheless think a brief description of the various operations, as we saw them conducted, will help to make clear the reason, or, at least, some of the reasons, why a good photographic paper cannot be made in such large establishments as we generally have in England and Scotland.

The first *sine quâ non* in the manufacture of good paper is a plentiful supply of perfectly pure water, and especially of water absolutely free from any trace of iron. In the manufacture of even ordinary paper this is necessary for the cleaning processes, as even a trifling degree of hardness would very materially interfere with the removal of the soap formed by the union of the caustic alkali with the grease in the rags, the carbonate and sulphate of lime which constitute the hardness forming with the soap an insoluble compound, the removal of which is both a tedious and costly process. For the finishing process—that is, pulping and felting—a hard water may be used in cases where the supply of soft water is limited, as at that stage the lime has no injurious effect, but is rather, by some makers, considered an advantage; although, of course, this does not apply to photographic papers, in which even a trace of lime is inadmissible.

The process may be divided into six operations:—1st, dusting and sorting; 2nd, cleaning; 3rd, bleaching; 4th, beating or pulping; 5th, felting; and 6th, drying and cutting. The rags, as received from the collectors, are handed to women and girls, who, each standing before a large vertical knife, rapidly cut and tear them into pieces of a few square inches, and roughly sort them according to quality, colour, &c. They are then passed to other hands, by whom they are more carefully examined, the seams undone, and buttons or other foreign matter carefully removed. From the sorting table they are passed to a machine technically called "the devil," which consists of drums or cylinders carrying long spikes, and revolving rapidly in opposite directions, by which the rags are teased and shaken till every particle of dust is removed. After sorting and dusting they are ready for the second operation, the cleaning—an operation of which those we saw stood much in need. It is effected by some six hours' boiling in a solution of caustic soda; this combines with all greasy matter that may be in the rags, forming a soap, which, along with every trace of dirt, is easily removed by a subsequent washing. From the washing apparatus the rags are carried to the "poaching engine," in which the third or bleaching operation is carried on. This consists of an oblong iron tank in which two drums revolve, and the rags are kept in constant motion while subjected to the action of a weak solution of chloride of lime, the chlorine of which is liberated by the addition of proper quantities of sulphuric acid.

When the bleaching is completed there is an arrangement by which a constant change of water is brought into contact with the rags, which seems most effectually to remove every trace of chlorine, thereby rendering the use of an "antichlor," in the form of either hyposulphite or sulphite of soda, unnecessary. From a description we got of the method of using the antichlor, however, we are certain there is little foundation for the very prevalent fear that it may be found in some of the mounts in general use, and so become a cause of fading. At the same time we think we have discovered a much more likely and more serious source of fading, to which, after completing a series of experiments now in progress, we shall return next week.

On removal from the poaching engine the bleached and washed rags, in a rough, pulpy state, are subjected to hydraulic pressure, by which they are made comparatively dry, and are then fit for the fourth, or pulping, process. This is done in the "beating engine," which, in appearance, is very much like the poaching apparatus. The principal part of this engine is the "beating roll"—a cylindrical mass of cast iron about three feet in diameter, and weighing about fifty cwts. Round the circumference of this, at short distances apart are placed steel cutters, which are caused to revolve almost, but not quite, in contact with a series of parallel cutting-bars at the bottom of the trough. The machinery is so arranged that the rags are caused to pass and repass between the cutters of the roller and the fixed cutters, by which they are partly cut and partly torn, so as to bring the mass into the most suitable form for felting.

At this stage of the operation the size is generally added. This consists of an alkaline solution of resin dissolved in water and sulphate of aluminium or, more generally, ordinary alum. The sulphuric acid of the alum decomposes the alkali, and allows the resin to attach itself to the fibre of the pulp, giving a firm toughness to the paper, and preventing the running of the ink either in printing or writing. This is called "engine sizing," and is in almost universal use for ordinary printing as well as much writing paper. At this stage the colouring matter is also added—ultramarine and a coal tar red, or a preparation of cochineal, being used for whites, and nitrate of iron and the same red for "toned paper."

From the "beating engine" the pulp is transferred by troughs to a large vat, in which it is kept in constant motion till run into the "knotting machine"—an exceedingly ingenious piece of apparatus, consisting of a frame of very fine wire gauze revolving in a trough filled with the pulp about the consistency of thin cream. In the centre of the gauze frame there works a series of rubber bellows, by which a partial vacuum is produced, and in consequence the pulp is drawn through, and so strained from knots or any particle of fibre larger than the meshes of the gauze.

The pulp, on its exit from the knotting machine, is at once spread on the couching or felting apparatus, consisting of an endless web of wire gauze, to which a rocking or vibrating motion is given, by which, as the water leaves the fibre, it is felted together in such a way as to produce the tough material, which has been the object in view throughout the whole operation. As the felted sheet passes along on the endless gauze the water is gradually separated, partly by running through the meshes, and partly by being drawn through by a pump acting on several square brass tubes perforated on their upper surface, across which the felt-covered gauze passes. The sheet is still further dried by pressure between felt-covered rollers, and, lastly, it passes under what is called the "dandy roll," on which any device in raised wire may be placed, which makes the "watermark," and also determines whether the paper shall be *laid* or *wove.*

Lastly: the now partially-dry paper passes under and over a series of hollow, steam-heated, iron cylinders, by which it is thoroughly dried. By an arrangement at the end of the series of cylinders it is cut into sheets of any desired size, and only needs picking and packing to be ready for the market.

Having thus briefly traced the system of manufacture as carried on in this country we are now in a position to show why our manufacturers have not succeeded in producing a paper suitable for photographic purposes, and also to suggest how the manufacture may be successfully accomplished; but, as we have already exceeded the limit of space at our disposal, we must leave that, as well as the hitherto unsuspected source of fading already spoken of, till next week.

## ON HOBBIES.

We now resume our pen in continuation of last week's article *On Hobbies*. In that article we endeavoured to show that every man ought to have a hobby as a relaxation from the ordinary cares of life; and we pointed out that hobbies might be divided into three principal classes, viz., scientific, artistic, and mechanical, whilst there were others of a miscellaneous kind. We left off with the suggestion that photography might be found in many cases a very charming hobby, combining the advantages of all three classes, and with a promise to enlarge upon this topic in the present number. So now to our task.

But here we are met at once by the question—If photography be such a charming hobby why are so many amateurs giving it up? Why are the ranks of amateur photographers becoming every year thinner and thinner, and beautifully less? Surely there must be some serious drawbacks to the amateur practice of our seductive art. Is it too difficult, too capricious, or too costly an amusement? *Le jeu ne vaut-il pas la chandelle?*

The processes mostly used by amateurs are common wet collodion and dry collodion plates; and they print from their negatives, thus obtained, by silver chloride upon albumenised paper. Can there be anything in these methods, as commonly practised, likely, after the novelty of the hobby has worn off, to disgust an amateur? Does he find them, after a time, to be altogether inapplicable to his wants? and, if so, can we suggest to him anything better in the way of a negative process for out-of-door work, or a printing process? If we *can* do this we may hope, perhaps, to see a revival of amateur photography and an accession to the ranks of amateurs — a thing devoutedly to be wished by all—by journalists, by professional photographers, and by the trade.

There is a general impression that nothing in the world can be more simple and elegant than the common wet collodion process. How, then, can we hope to improve upon this? Go into the dark room of some clever professional, and watch the whole process of taking a portrait—how quickly and simply it is performed! The plate is cleaned, collodionised, excited, exposed, developed, and varnished—all in a quarter of an hour; and it is then handed over to the retoucher! How rare are the failures! With what precision the entire series of operations is performed! How can we ever hope to improve upon this? Surely such a process must delight the heart of an amateur! But it is not so. Unfortunately its simplicity is not real, but only apparent. The fine and faultless negative is the result of most delicate reactions amongst chemicals, which must be in most perfect order, and the least derangement in any one of them will put the whole thing out. So ticklish is this very simple process that it remained for years in the hands of thousands of clever experimentalists before it was brought to its present state. It is true that the manipulation may be easily acquired, and that the chemicals can be bought in a fit state for use; but, unfortunately, in the hands of a tyro they very quickly get out of order, and what is he then to do with his costly collodion and disordered nitrate bath? Besides which, simple as the process appears to be in the dark room of a professional portraitist, surrounded with every necessary appliance for successful work, it is far otherwise when a view has to be taken away from home. The very simplicity of the operations and the rapidity with which they must follow each other require that they be performed on the spot whence the view is taken; so that the dark room must be on wheels, and be drawn to the place by a horse, or there must be a dark tent conveyed thither, along with the whole of the chemicals and apparatus, by porters employed for the purpose. But a "hobby" thus practised becomes a very costly and laborious one, and not at all adapted to the requirements of an amateur, whose chief amusement consists in taking views when he is on a tour of pleasure in the country.

But, waiving these objections for a moment, is the wet collodion process really so simple as it appears to be in the hands of an expert? We fancy not. Like everything else that is skilfully performed it *appears* easy enough, although in reality it is not so. Go and watch a skater on the Serpentine; with what ease he can cut figures of eight, wheeling round first on one foot, then upon the other! Or watch a glass blower or a potter at his work; or the nimble fingers of a Thalberg on the piano, or a Paganini on the violin; or a skilful algebraist covering sheets of paper with strange symbols in a difficult piece of integration, performed with marvellous rapidity and accuracy. Or, to descend to the lower animals, watch a humming bird poising itself before a flower; or a sea-gull sweeping through the gale or diving into the billows! How simple all this looks! yet it is the result of much practice and experience. Now, it is just the same with the wet collodion process. This is no exception to the general rule; and here the expert has only arrived at a full mastery of his art after passing through many a painful and costly failure.

Let us turn, then, to dry collodion plates as commonly prepared. Do these exactly meet the requirements of an amateur? It really does not seem so. There are very few amateurs who can yet prepare a really good and certain dry plate, although the subject has been largely discussed in the journals during the past fifteen years, and hundreds have tried their hands at the problem. It is true that dry plates of excellent quality can be purchased ready prepared; but they are necessarily expensive, and very liable to accidents and to be spoiled in the development.

Moist plates, again, such as have been proposed by Mr. Sutton for the occasional use of professional photographers, are not at all adapted to the general requirements of an amateur. In which direction, then, are we to look for a process which *is* suitable for him; that is to say, in which the difficulties shall be chiefly mechanical and not chemical, and for the practice of which all the ingredients can be obtained ready for use at a cheap rate, and not liable to get out of order?

For the second time we point to such a process, and its discovery has been a really important event in our art. It was made last year, and we will again endeavour to show how, by means of it, amateur photography in the field may take "a fresh departure," as seamen say.

An amateur can now buy a collodio-bromide emulsion ready prepared, and which will keep its good qualities indefinitely and be always ready for use. His travelling equipment will, therefore, consist of a bottle of this magic compound, some clean plates, and a few small phials containing the substances used in developing. He can then prepare sufficient plates for a day's use, in the bedroom of his hotel, by simply pouring the emulsion over them and putting them into his dark slides, and he can develope them at any convenient opportunity. No nitrate of silver is required, and there will, consequently, be no risk of his blackening his fingers or other people's property with silver stains. By this process all the *chemical* difficulties are eliminated, so far as the amateur is concerned, and photography becomes reduced to a simple mechanical operation performed under the guidance of taste. This is just what it should be, and nothing more can be reasonably desired. By adopting a simple process of preparing dry plates *en route* as they may be required the troubles of the common wet or dry collodion processes are avoided, and amateur landscape photography is enabled to turn over quite a new leaf.

Next let us consider the printing process. We venture to say that the common method of silver printing upon albumenised paper and toning with gold is, like the common wet collodion process, much more difficult than it appears to be to a tyro who watches the series of operations in the hands of an expert. As soon as he begins to try it for himself he finds that the toning and fixing involve *chemical* difficulties which it requires long practice to surmount. Our advice to the amateur is, therefore, to have nothing to say to silver printing, but to employ carbon printing, both by single and double transfer, which he will find involve *mechanical* difficulties only, and which are very easily got over. He can buy all the requisites for this process from the Autotype Company, of the best quality and at a reasonable rate; and the process is available not only for paper prints, but for glass transparencies, magic lantern slides, pictures upon porcelain, opal, ivory, &c., as well as for pictures upon glass, which can be coloured at the back. Carbon printing is, in fact, the process for the amateur, *par excellence*. It seems to have been invented with a special reference to his peculiar wants.

But now we have once more filled our space, and must defer what yet remains to be said respecting amateur photographic appliances

to the next number. Meantime, let old amateurs reflect seriously on what we have now advanced, and be ready by and by to contribute, in our correspondence columns, such suggestions of their own as ours may seem to demand. Our *postulatum* is this—that for an amateur all *chemical* difficulties in photography should be cleared away, and nothing left for him to encounter in its practice but such mechanical ones as common ingenuity and neatness can surmount—always, be it understood, under the guidance of taste, which every day of fresh experience will be certain to improve.

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When, at a lantern entertainment given recently at the House of the Society of Arts in connection with the South London Photographic Society the hydrogen fell short, and its "place was filled" by common carburetted hydrogen drawn from the mains, many of the members present expressed their surprise at the light, so far from falling off, being rather improved in quality. We thought it had now become universally known that between the pure and the carburetted hydrogen when used in the production of the lime light there was practically no difference. Indeed very few exhibitors now use pure hydrogen, preferring the cheaper and more easily-procured house gas. It is not every form of burner, however, that will permit of a good light being obtained when the gas is conveyed direct from the ordinary house fittings to the lantern. There are some burners—and we are now referring to those in which the gases are mixed before issuing from the jet—by which the slightest variation in the pressure of the coal gas passing through the pipes produce such an unsteady degree of illumination with the lime as to cause much annoyance to the exhibitor. On one occasion, when we were exhibiting transparencies as dissolving views with mixed gases and a *direct* carburetted hydrogen supply, one of the two burners employed yielded a light of such varying equality as to necessitate its being discarded for the time. The sole difference between it and its fellow, which behaved admirably throughout, consisted in the internal dimensions of the jet of one being much larger than the other. The successful one was formed of a piece of rather thick and clumsy brass tubing, while that which failed was neat and elegant, with a *small bore* from end to end, the apertures being alike in both burners. A jet similar to that of the burner which yielded the steady light having been fitted to the other, both were afterwards used with much success under similar circumstances to those in which they were originally tried and failed. When the jet is one of the safety or "blow-through" kind the source of hydrogen supply is then immaterial; but when a light of the highest order is required it is desirable, if not absolutely necessary, that the hydrogen as well as the oxygen be supplied to the lantern from a heavily-weighted bag.

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## HYPOSULPHITE OF SODA AND FADING PHOTOGRAPHS.

With reference to my article on this subject, published at page 613 of the last volume of the Journal—the tenor of which opposed the usually-accepted theory that the fading of albumenised prints was due to the hyposulphite of soda left in them, and which opinion the Editors considered erroneous—I am induced to call attention to a few facts connected therewith to support my view of the matter. It is to be borne in mind that I do *not* for an instant assert that hyposulphite of soda will not cause fading, but that the fading, as we have it continually brought to our notice, is *not* caused by hyposulphite of soda (a distinction with a considerable difference) unless it be associated with other conditions that have been induced by want of knowledge in the manipulator, or, I might say, by the misinformation upon which he relied—perhaps a little of both.

It is not so very long ago that the fact of fixing the prints by a solution of hyposulphite of soda in a non-actinic or weak light was acknowledged to be conducive to their permanency. By fixing in full daylight they were found to become discoloured much sooner. True it is that many operators did fix their proofs in a subdued or yellow light; but the only reason for this was that it was more convenient to do so, and without the slightest idea that they were conforming to a chemical necessity which, if violated, would injure their productions.

Because such men as Hardwich, Sutton, Davanne, or Girard—eminent and painstaking chemists—decide, after much and careful experimenting, that hyposulphite of soda will destroy the photographic image if allowed to remain in contact with it in a moist or more or less concentrated form, is no proof whatever that the same chemical will, when in an extremely diluted form, or in a *dry state*, do the same thing. Continual moisture will sooner or later, without the aid of chemicals, destroy or injure almost every existing organic substance, photographs not excepted; but that a minute trace of dry hyposulphite will have the effect of a moist, concentrated solution I utterly repudiate. I am quite satisfied, from experiment, that a small trace of hyposulphite will have *no* visible effect upon an otherwise carefully-prepared and dried silver print.

Every day we may observe instances of a solution acting powerfully, or being inert, according to its strength, or even the production of an entirely new substance by a certain strength of solution that will be destroyed by one of another strength. For example: we find a hard-worked negative nitrate of silver bath suddenly becomes full of crystals of nitrite, which adhere to the collodionised plate, rendering the image imperfect, and accumulating in considerable quantity at the bottom of the bath, but which will all disappear on the addition of a little fresh stronger solution of nitrate, and their places be no more seen.

When we know this fact from experience, why should the possibility or probability of dry hyposulphite of soda in excessively minute quantity be credited with producing the effects of a full dose of the same with no other difference than being slower in its action? Unmounted plain paper prints, in common with those on albumenised paper, will, under certain circumstances, turn yellow and fade if *no* hypo. whatever has been used in their preparation. Let them be fixed in weak solution of cyanide of potassium (of course in practice this is not used, for a variety of reasons which need not be entered upon here); then, if hyposulphite were the cause of fading, such prints ought to be permanent, instead of which they fade more rapidly than those fixed with hypo. Other causes, then, are evidently at work to produce this injurious change; nor can the blame be laid on persulphuration.

Absolute permanence is not in the nature of any created thing. The nearest approximation to it, so far as photographers are concerned, is ordinary printed matter; and to obtain such permanence in their photographic work has been the earnest endeavour of operators from the first introduction of our useful art. The fact of silver prints fading more rapidly or more generally than plain paper ones is not to be wondered at, so many more elements liable to decay entering into their composition, and the difficulty of removing objectionable matter so much more difficult than with plain paper.

In the article already alluded to I specially instance the fading of silver prints on albumenised paper and mounted, this being the class of pictures we find suffer most severely. I am perfectly satisfied that silver prints can be easily made and left unmounted which are, in common *parlance*, "permanent" to all intents and purposes, and that when they fade they do so by reason of some neglect in their preparation—some little matter so seemingly trifling as to have escaped observation, but which has, notwithstanding, made its mark and ensured the ultimate injury of the print.

It is scarcely so much a question of what *will cause* prints to fade as what *has caused* the faded prints so generally seen—a distinction *with* a difference. We know, and I quite agree with the Editors, that sulphur is an active enemy to them, as are a thousand other things; and in case of carelessly-prepared pictures there may be elements of destruction introduced of which no one except the producer can be aware, and most likely he cannot himself, being, as is too frequently the case, utterly ignorant of every rule except the rule of thumb. I believe, however, that in this respect wonderful improvements have been made of late years, and that the photographs sent out by the majority of good houses in the present day will average much greater permanence than those of former times—not from any great change in the character of the manipulations, but from the greater amount of care and intelligence brought to bear in carrying them out.

Edward Dunmore.

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## ON THE NITRE-SULPHUR LIGHT FOR PHOTOGRAPHIC PURPOSES.

[A communication to the London Photographic Society.]

Renewed attention having been directed to artificial lights suitable for copying and enlargements by the recent communication of M. Franck de Villecholle to the Photographic Society of France, I have been led to consider whether some means of obviating the danger attending the use of a lamp fed with nitric oxide and bisulphide of

carbon could not be devised; and, after going fully into the matter, I hasten to propose as a substitute another method of effecting the combustion of sulphur, whereby a light possessed of great photographic intensity is generated under conditions more perfectly within control.

When common saltpetre (nitrate of potassium) is heated to a temperature somewhat beyond the point of fusion in a hard glass tube or porcelain capsule mounted over a spirit lamp, and small pieces of sulphur are then successively introduced, a deflagration ensues, accompanied by the emission of an exceedingly brilliant white light, which is maintained as long as any of the sulphur remains floating as a molten globule in the fluid nitrate. Carbon, in the form of coal or charcoal, gives nothing like so good an effect; and the alkaline carbonate produced has a corrosive action upon the glass or porcelain, which is not the case with the neutral sulphate resulting from the combustion of sulphur. The chemical reaction expressing the change which occurs in the case of sulphur and nitre appears to be the following:—

$$S_2 + 2\ (K\,N\,O_3) = K_2\,SO_4 + SO_2 + N_2.$$

Guided by the ratio of the atomic weights 32 : 101, it ought to be possible to burn one part of sulphur at the expense of three parts by weight (or rather more) of dry saltpetre; and this I find to be the case in practice. It will further be noticed that the combustion of the sulphur when regulated in this manner gives off only half the normal amount of sulphurous acid in fumes, the rest of the sulphur being locked up in the saline residue. This circumstance offers another important advantage over the Villecholle lamp, if it should prove to be equally efficacious; and there is no *solid* product thrown off, as in the case of the chloro-chromic light or burning magnesium. I remember seeing a photograph of the interior of the Great Pyramid taken apparently by the last-named system of illumination, for the white clouds of magnesia were palpably visible about the roof of the gallery.

The cost of this light is very trifling, both ingredients being remarkably cheap. One ounce of nitre melted, and fed with sulphur at the rate of eight or ten grains at a time, will keep up a brilliant light for about ten minutes, at the cost for materials of a halfpenny; but it must be confessed that the wear and tear of apparatus, from the intensity of the heat, adds to the cost of production.

To guard against fracture or actual perforation of the glass during the course of the experiment, it is necessary to provide a tin tray into which the fluid contents of the flask may drop in case of accident. An ordinary spirit-lamp is found to give sufficient heat to melt the nitre and start the reaction; when once the light is produced the spirit-lamp may be removed, or the holder supporting the flask turned aside. Short lengths of stout "combustion tubing" closed at one end serve exceedingly well for making the experiment, this kind of glass being so difficultly fusible. If iron capsules be employed it is only possible to work with the top light, which may, however, be reflected to any required angle; and with porcelain crucibles much of the effect is lost by the partial opacity of the material. In the event of the nitre-sulphur light being required to be maintained for a lengthened period it would, of course, be desirable to provide some kind of chimney to carry off the gaseous products of combustion, or absorb the sulphurous acid with peroxide of manganese.

With respect to the actinic value of the light, I find that from three to five seconds' exposure, according to the density of the negative, is sufficient to give a collodion transparency at a distance of a foot from the source of light, when produced on a small scale. The maintenance of a constant degree of intensity is, perhaps, one of the points open to future improvement. I have the pleasure of showing two photo-transparencies taken by Mr. George Hooper and myself a week ago.

I have tried the use of nitrate of sodium in place of the ordinary saltpetre, and experimented with various metallic sulphides and finely-divided metals; but none of these answered so well as the simple attack of sulphur, in the form of roll brimstone, by melted nitre. Their spectra also appeared to be more limited. With the chlorate of potassium and sulphur a light of dazzling brilliancy is emitted; but the deflagration is very violent, and white fumes are given off by reason of the greater volatility of the chloride of potassium—a by-product in this reaction.

In conclusion: I have only to state that no claim of novelty is set up for anything beyond the photographic use of the nitro-sulphur light, the light itself having been shown as a lecture experiment certainly as far back as the year 1850, when I had the honour of officiating as lecture-assistant to Dr. A. W. Hofmann at the Royal College of Chemistry; and I find even an earlier account of it at page 221 of Griffin's *Chemical Recreations*, published in 1847.

John Spiller, F.C.S.

## ON THE USE OF PHOTOGRAPHIC AND CHEMICAL APPARATUS.*

### IX.—HEAT MEASURERS—THERMOMETERS.

From the great importance of the subject, this chapter on thermometers will, at the risk of being considered of too advanced a nature for this elementary series, be made fairly comprehensive, and will enter with some minuteness of detail into the testing and the use of this invaluable instrument, which one of the leading chemists of the day, Mr. Watts, terms "the most important and indispensable of all instruments in most physical researches." It is in most intimate relation with all weights and measures, and has an importance of its own which is increasing year by year with the progress of chemistry. Its use enables one to predicate changes of composition by changes of temperature in the boiling point of some substances; to purify liquids by driving off admixtures which volatilise at a fixed point; and, in a similar manner, to obtain various new compounds by fractional distillation; and in very many other ways it is in daily use. The beautiful theory of atomic volumes could never have been elucidated without its aid, while the practice of everyday chemistry in the studio or out of it is equally indebted to it.

The construction of the thermometer depends upon the change of volume which all substances undergo by alterations in temperature. Within certain limits these changes are perfectly regular, equal increments or abstractions of heat causing equal increase or diminution of volume. The substance always occupying the same volume at the same temperature, the measure of their volume and the measure of their heat are convertible terms. For chemical purposes the expansion of liquids, generally mercury or spirit, is made use of, a thermometer being, in effect, simply a vessel holding a liquid, and having attached to it a register of the volume the latter occupies under certain conditions of heat. In its simplest form it is a glass bulb attached to a long tube of very fine bore, the bulb and a portion of the tube at ordinary temperature being filled with a liquid. Upon its exposure to any heat by immersion in a liquid or otherwise the mercury expands, and, as the whole thermometer tube when filled would hold a very minute quantity, a very slight expansion of the contents of the bulb causes a considerable rise in height of the column of mercury in the tube. A similar change in a contrary direction occurs upon the abstraction of heat.

Certain marks being attached to the tube opposite the height of the column of mercury or spirit, as the various temperatures, the instrument can always be used again to ascertain when the same heat is reached by any fluid by immersing it, and observing if the column reach to the same height. But all varieties of temperature need to be observed to minute differences, and extending over a wide range from great cold to great heat. For this purpose these register marks are multiplied to a great extent; and that these minute shades of difference may be noted, and such memoranda made, that a few simple expressions can convey to anyone an exact record of any definite degree of heat arrived at, these markings are arranged and classified according to a well-understood plan. Two fixed natural temperatures are taken, and the thermometer marked where the column of fluid stands at these temperatures; the space between the two marks is then divided into a definite number of equal divisions called degrees (marked °), and from the number of these degrees, which, taken as a whole, are called "the scale," the names given to various kinds of thermometers depend. The heat of water when freezing and when boiling are the two points taken.

In the Centigrade thermometer this space is divided into one hundred degrees, and in the Fahrenheit into one hundred and eighty. In the former the freezing point is called 0 or zero, and the boiling point of course 100. In the latter the freezing point is called 32, and the boiling point 212, *i.e.*, 180 degrees more, the zero (0 degree) being thirty-two below freezing. The scale is extended above and below these two points by divisions or degrees of equal size with those obtained as described. When below zero they increase from 0 downwards, and are written with a *minus* sign, thus "—15" means 15 degrees below zero. It will be seen that these numbers are purely arbitrary, and bear no essential relation to the amount of heat present; if 50 or 150 or 1,000 had been selected they would be equally useful. If the thermometer is said to indicate fifty degrees Centigrade it merely expresses the fact that the mercury or spirit in a bulbed tube has risen just fifty one-hundredths ($\frac{50}{100}$), or half-way between the points it would stand at in boiling and in

* At the conclusion of Chap VIII., page 7, the third sentence in the last paragraph should read as follows:—"For future use a moment's immersion of the hydrometer in a solution made by guesswork at once tells its strength and indicates the amount," &c.

freezing water, and all fluids which cause the column to rise to this point will be at an identical temperature; at seventy-five degrees the fluid would rise $\frac{75}{100}$, or three-quarters way, and so on for all temperatures.

For attaching these degrees, or the scale, permanently to the tube three plans are mainly in use:—First, and most accurate: the scale is engraved upon the stem or tube of the thermometer direct, which is usually made thicker for that purpose, giving it greater strength at the same time. Second: the thermometer tube is enclosed within another tube, the scale being first made on either a slip of paper or a piece of ivory or milk glass, and attached to it by suitable means; the external tube is fused into one mass with the tube near the bulb to avoid risk of breakage or displacement of the scale. Third: the scale is marked on a broad, flat piece of wood or ivory, &c., the thermometer being attached to it by metallic bands, and is generally grooved along its length and pierced through with a circular aperture where the bulb lies, to preserve it from contact or pressure.

The latter form is modified also by the scale or support being hinged at the lower or bulb end, and so able to be turned back to leave the bulb free that it may be immersed in any caustic or corrosive liquid. It is a shape, however, which has many disadvantages, and is not at all to be recommended for laboratory use, as it is certain to be attacked, sooner or later, by corrosive vapours or splashes.

The first form spoken of is generally termed a "chemical thermometer," as in its various modifications it is the only one fitted for real laboratory work. Some years ago Messrs. Negretti and Zambra introduced a very great improvement in thermometer tubes. Instead of making them wholly of clear glass they made them with a backing of opaque white glass, forming part of the tube itself, which threw out the thin column of mercury in a manner which a separate paper or ivory backing was unable to do, and it thus rendered possible the use of a finer thread of mercury and consequent greater delicacy in its indications. The best thermometers are now always made with these "enamel tubes." Another aid to delicacy was gained by making the bore of the tubes very thin and flat instead of circular, as was first done, an almost invisible circular thread sufficing to form a very plainly-visible band when flattened out. The circular form is rarely met with now, and in purchasing a thermometer it should never be chosen.

For use with small quantities of fluid specially small thermometers are made, as the introduction of a large bulb in a small portion of fluid would lower the temperature sufficiently to cause false indications. They are not so well fitted for general use, as the thread of mercury is necessarily minute, and so is difficult of reading. These are sometimes made, for specific gravity bottles, in the shape of stoppers, many of them having marks only at 55°, 60°, and 65°, which are often all that is necessary, the expense of graduation being thus saved. It is obvious that the greater the length of column enclosed by one degree the greater will be the delicacy of indication; but there is in one direction a practical limit, as an instrument graduated between, say, 0° and 560° Fah. would become unwieldy if of more than a certain length, the size of the degrees, of course, being regulated by the length of the instrument. In many operations the thermometer is only required for a certain range of temperature, and, in that case, the whole length of the tube might be used for that range, and instruments are so constructed with a range of a few degrees between any desired points. For making pyroxyline I employ one graduated from 110 to 180, these degrees occupying nearly twelve inches. Its bore is also made specially wide so as to be easily read while surrounded with the acid fumes, and is expanded at the top to form a chamber for the purpose of receiving the mercury if through any cause the thermometer be subjected to a heat greater than the scale shows, under which conditions the thermometer would burst if this chamber were not provided. All thermometers not graduated to 500 or 600 should be constructed with this chamber, as, under the most modern and improved system of filling the tube, it is possible to make them quite free from air, though a contrary statement is to be found in many works.

The shape of the bulb is a matter for some consideration. It has been made of every conceivable shape under the sun, with the idea of obtaining either sensitiveness or speed in indication. Three standard forms are now generally made—globular, pear-shaped, and cylindrical. The latter is the most generally useful, and, where only one is used, should be the one selected. The globular or the pear-shaped are supposed to have the advantage as regards stoutness and reduced risk of breakage; but it is slight, and the cylindrical bulb has many counterbalancing advantages, the chief being the convenience it affords for introducing the thermometer through corks in retorts, into bottles, flasks, &c. The thermometers in popular use in this country are graduated according to Fahrenheit; and on the continent the Centigrade and Reaumur scales are in common use. In the latter the boiling point is 80°, and the freezing 0°. The Centigrade scale is, however, now becoming more generally adopted by chemists everywhere, for the purpose mainly of securing greater uniformity in chemical literature. It possesses few advantages to cause it to be selected before the other forms, and, indeed, on its own merits, the Fahrenheit is the most useful of the three systems—its zero being low in the scale, the inconvenient *minus* sign is rarely required, and the degrees being only about half the size of the Centigrade more minute differences are registered. G. Watmough Webster, F.C.S.

*(To be continued.)*

## FOREIGN NOTES AND NEWS.

M. Leon Levi's Exhibition of Stereoscopic Views.—M. Viallet's Portraits.

Some few months ago Mr. Sutton, in one of his letters from Redon to this Journal, alluded to a travelling exhibition of stereoscopic views upon glass, made in what is called a "*maison routante*," or house upon wheels, which had visited that little town on the occasion of one of the great fairs held there. He stated that this exhibition excited much interest and was well attended; also, that the views were of the finest quality, and each one separately lighted by means of a powerful lamp. There is now open a similar exhibition to this in Paris, though on a much grander scale, and stationary. The views are all upon glass, and each one is separately lighted in the most effective manner. They are for the most part by M. Leon Levi, the subjects having been taken in many different countries, so that scarcely a portion of the globe remains unrepresented. Thus in the course of one hour the visitor may make the tour of the world, and gain such information respecting its many wonders and beauties as it would be utterly impossible for him to gain in any other way. There is a performance going on now at the Porte St. Martin theatre, with much success, in which the audience are taken round the world in eighty days; but the exhibition of stereoscopic views goes far beyond this. Let us hope that it will pay, for the idea is good and worthy of imitation in other capitals besides the gay metropolis of France. Possibly Londoners might encourage a similar attempt.

But now the question arises whether something better than the common stereoscope might not be devised for a grand and important exhibition of this sort. It is quite a common complaint with people that looking through an ordinary stereoscope at a considerable number of slides greatly fatigues the eyes and brings on headache. This is, perhaps, owing to the fact that a stereoscopic view being in general three inches wide, whilst the eyes are only two and a-half inches from centre to centre, the views, if placed side by side in the instrument, must be looked at through the excentrical portions of lenses, whereas they ought to be viewed through their centres. We have, therefore, to consider whether it would be well to print glass stereoscopic views two inches wide instead of three, and place them nearer to the lenses, which would then be of shorter focus; or whether a better instrument than the common one might be devised for viewing even larger glass transparent slides than those of the present size, and that through the centres of the lenses.

We have now before us an entirely new form of stereoscope, invented by Mr. Sutton, in which a pair of glass transparencies five inches wide are viewed through the centres of the lenses. All who have used this new instrument agree that it does not fatigue the eyes in the least, and that the effect is much finer than in the common small stereoscope. If a considerable number of such instruments were required for the purpose of a grand public exhibition of stereoscopic views, they might be made of pine at a tolerably cheap rate; whilst the fact of the views being separated, and not upon the same plate, would be of no consequence whatever. But a formidable objection to the use of such an instrument would be that the present small views would not answer the purpose, and everything would have to be taken over again. If skilful amateurs would bear a hand in such a work, and do whatever was worth doing in their own neighbourhood, in the course of a year or two such a splendid exhibition of stereoscopes might be got up as the world has not yet seen, or scarcely hoped to see.

A photographic portraitist, by name M. Viallet, residing in the town of Ajaccio, in Corsica—the birthplace of Napoleon I.—has produced, although entirely self-taught save from such lessons as he has gathered from the photographic journals, some of the most charming portraits that have yet been seen. We made the acquain-

tance, some five years ago, of a professional portraitist doing a large business in a continental town and turning out first-rate work, who had learnt his profession entirely in the same way—from reading the photographic journals—and had never seen a plate coated or developed by any one but himself until we performed the operations in his presence. No doubt hundreds of professional photographers in different parts of the world are in the same plight, and the fact speaks volumes for the utility of the journals which are devoted to our art and which record its weekly and monthly progress.

M. Békétoff has communicated a paper to the French Academy of Sciences on the action of hydrogen upon nitrate of silver. We shall have something to say about this next week.

## LORD LINDSAY'S TRANSIT EXPEDITION.

Several scientific men recognised in Lord Lindsay's preparations for observing and photographing the recent transit the most perfect of all the equipments dispatched from this country. For this equipment his lordship was responsible, the expedition being fitted out at his own expense and conducted entirely by himself. News has been received from this party that a hundred and ten *excellent* photographs have been secured out of more than two hundred taken altogether. The method employed by Lord Lindsay differed from that of many others in this respect—that, while the latter used equatorially-mounted telescopes which projected an *enlarged* image of the sun upon the sensitive plate, the telescope itself in each case being moved by clockwork, in the case of the Lindsay expedition a fixed camera was used, not directed towards the sun itself, but to a very perfect mirror, by which the image of the sun was directed into the camera, and which, being moved by clockwork as all heliostats are, caused the sun to be in effect a motionless object in front of a motionless camera having a lens with a focus of forty feet, and thus giving a direct image of the sun of four and a-half inches diameter.

The advantages of this method are well set forth in an article in the *Daily News* of the 19th inst., in which the writer, with special reference to Lord Lindsay's photographs, says:—

These photographs have not been taken by means of photoheliographs, like those with which our De la Rue and the American, Rutherfurd, have obtained their beautiful sun-pictures. All the other European parties have unfortunately employed this photographically-effective but astronomically-unreliable instrument. We deliberately say "unreliable" here, not untrustworthy, which would express rather more than we desire to imply. Yet it has been mathematically demonstrated that, according to De la Rue's own estimate of the probable error resulting from the use of photoheliographic sun-pictures, the error in the measurement of the sun's distance would probably be greater than that which existed before the late transit. The method used by Lord Lindsay and the American astronomers is, on the contrary, almost perfect, theoretically. Let the difference, which does not seem to be commonly understood (for many erroneous statements have been made on the subject), be here briefly indicated.

Suppose we have a picture of the Sun, with Venus upon his face, taken by the photoheliograph; and another picture of about the same size taken by the other method, which may be called the heliostat method. In examining the former picture, we know that there has been telescopic enlargement of the solar image formed at the focus of the object-glass; and in the absence of any sufficiently exact means of determining the amount of this enlargement we must trust to the picture itself to indicate its own scale. There, in the picture, is the sun with the disc of Venus upon it, and the distance of Venus from the centre of the sun bears a measurable proportion to the sun's diameter in the picture. It might seem, then, that we know all that we want to know. But does the sun's diameter in the picture correspond to the reality? May not the collodion film have contracted to some degree? or, if we are quite sure that this has not happened, may not the apparent size of the sun have been enlarged slightly by what is called photographic irradiation? Unfortunately we have every reason for doubt on these points. In fact, the admission recently made by Sir G. Airy, that a daguerreotype is infinitely more perfect in this respect than a photograph taken by the method which he has nevertheless officially sanctioned, can bear no other interpretation than this—that that method is unreliable, and that the results obtained by it are untrustworthy. Now take the photograph by the other method. In this a perfect plane mirror, carefully tested, is so moved by machinery as always to send the sun's rays in the same horizontal direction towards an object-glass having a focal length of forty feet. The mirror acts thus as a heliostat, hence the name we have given to the method. This length is sufficient to give a focal image of the sun requiring no enlargement—in fact, the image is about four and a-quarter inches in diameter; and the astronomer is not concerned to know whether the actual photographic picture is correct. It may be enlarged by irradiation or diminished by the contraction of the film; but he knows exactly how large it is without measuring from its outline. For he knows the exact focal length of his object-glass, and the size of the image is thence calculable at once, being precisely the size of a circle, which, viewed from that distance of nearly forty feet, would appear as large as the sun. But indeed, as will presently appear, he is independent even of this determination.

Again: the little white disc, representing in the negative the black disc of Venus, may have its outline blurred by irradiation; but, whether much blurred or little blurred, it is equally blurred all round, and the position of the centre can therefore be exactly determined. Similarly the position of the sun's centre can be exactly determined, and the length and position of the line joining these centres are all that the astronomer wants to know. In the other method he can measure this line just as readily in inches; but, as we have seen, he does not know what an inch or any other linear measure in his picture represents in angular displacement from the sun's centre. In the heliostat method he knows that an inch in his picture represents an inch seen at a distance of forty feet, or whatever may be the exactly-determined focal length of his object-glass. In short, in one method the inches of the picture are directly comparable with inches of focal length; in the other they have to be compared with the inexact evidence given by the sun's picture itself, which has, indeed, a diameter of so many inches, but may, perhaps, have been photographically expanded or contracted.

It is in this respect that the news from Lord Lindsay is so important. He has secured more than a hundred trustworthy pictures obtained by a really reliable method. The astronomical value of his station is about equal to that of Hobart Town, and nearly equal to that of the American station in New Zealand. Accordingly we now have three excellent sets of southern photographs for comparison with those known to have been secured by American astronomers at Wladiwostok and Nagasaki.

## THE ORIGIN, AIM, AND ACHIEVEMENTS OF THE PHOTOGRAPHIC SOCIETY, WITH SUGGESTIONS AS TO ITS FUTURE DEVELOPMENT.

[A communication to the London Photographic Society.]

The Photographic Society was founded on the 30th January, 1853, the first meeting being held at the rooms of the Society of Arts, John-street, Adelphi. Its first President was Sir Charles Eastlake, P.R.A., and it had Earl Somers, Sir W. J. Newton, and Professor C. Wheatstone, F.R.S., as Vice-Presidents. Amongst the original members of Council were Dr. Hugh Diamond, P. Le Neve Foster, M.A., Robert Hunt, F.R.S., Dr. John Percy, George Shaw, and Captain Scott, R.N. Alfred Rosslyn acted as Treasurer, and Roger Fenton as Honorary Secretary.

In this paper I shall review some of its special achievements, both in encouraging art and scientific research; and, after taking this retrospective glance, make suggestions of a practical nature as to the best means to be adopted to increase its usefulness, and thereby raise the status of the art generally, and necessarily those who practice the same, in the eyes of the public.

The art of photography will, doubtless, be handed down to all ages as one of the most important inventions of the nineteenth century.

It not only has been the means of creating a new industry, but has itself become more or less connected with every other known industry, so that whether it be religion, law, politics, manufacture, or education, it plays its part. It has, like the telegraph, brought all the world together, so that we can familiarise ourselves with the features of every race of mankind and study their habits and customs. In fact, to summarise its immense capabilities, we may say that things animate and inanimate have been represented with a truthfulness otherwise unattainable; and even things so minute as to be invisible to the natural eye can be easily photographed and enlarged to prodigious dimensions.

Science generally has benefited by photography; a love for real art has been generated, as well as a deep regard for that which is both truthful and beautiful. This can be proved by referring to many of the topics that have been so ably brought forward and discussed at the meetings of the Photographic Society. Daguerre, Fox Talbot, and Archer are three of the names that will always be inseparably connected with this fascinating art.

The Photographic Society began its career under the most flattering and encouraging circumstances. It had Royal patronage; many of the nobility figured in its ranks; funds were lavishly expended, and within four years it had over one thousand pounds in funded property.

It is generally considered everything to start well; but we have also heard it said by wise men "that early success, unless accompanied by experience, often leads to a rapid decline;" and this was somewhat the case with this Society. It began too well, considering all experience had to be gained; and this experience almost cost the Society its life. However, thanks to the determined energy of some of its most constant and earnest friends, it survived this sudden and rapid decline, has for years been on a firm basis, and may now be said to have a good constitution.

The Photographic Society has arrived at its majority, and is this very month entering upon its twenty-second year; nevertheless, it cannot be said to be full-grown. Far from it; for there is yet an immense field of

usefulness ahead, and the Photographic Society of Great Britain must take the lead in developing the varied branches of the art. It must act as pioneer, and by scientific investigation, discussions, and (if possible) practical demonstrations lay before the world all that is new and interesting.

A brief review of the past proves how productive the young art was when this Society commenced in 1853. Four papers were read at the very first meeting—one being *Photography in an Artistic View and in its Relation to the Arts*, by Sir William J. Newton; another on the *Wax Paper Process*, by J. Percy, M.D.; another entitled *Photography as an Aid to Engineers*, by Sir C. Vignoles, C.E.; and the last, a paper *Upon the Mode it is Advisable the Society should Conduct its Labours*, by Roger Fenton, Honorary Secretary. At the second meeting *The Collodion Process* was under discussion; at the third and fourth meetings, technical matters; and at the fifth, Sir Charles Eastlake, the President, was able to announce that Her Majesty the Queen and H.R.H. the Prince Consort had consented to become the patrons of the Society.

Next came papers by Mr. Claudet on the *Daguerreotype Process;* by Dr. Diamond on the *Calotype Process;* and Roger Fenton on the *Nitrate Bath;* also by Mr. Wenham and Mr. George Shadbolt on *The Production of Large Prints from Small Negatives*. It was at this period that Mr. John Spiller (our President) first published a formula for preparing a *Protonitrate of Iron Developer*.

The Society's first exhibition of photographs was opened on the 3rd of January, 1854, with a *soirée* at the Suffolk-street Gallery, the Queen and Prince Consort taking a private view at eleven a.m. of that day. This exhibition remained open two months. We would mention here that the journal of the Society was at this time very popular, having as its contributors many gentlemen of scientific eminence. It was sold at threepence per number to non-subscribers, and had (I believe) a circulation of between three and four thousand copies.

In January, 1855, the exhibition was held in the Gallery in Pall Mall East. The following month, Sir Charles Eastlake retired from the presidency, and the late Lord Chief Baron (Sir Frederick Pollock) was elected to the position. In the same year a committee of seven gentlemen was formed to investigate "the causes of fading of positive prints." The Society voted £25 towards defraying the expenses; the Prince Consort gave £50 for the same object. Mr. J. E. Mayall read a paper on the *Dry Collodion Process*, and in September the Taupenôt process was introduced. January the 3rd, 1856, the Society appointed a paid secretary and editor at a salary of £200 per annum; prior to this an editor received £60 per annum, an assistant secretary £30, the sale of the Journal realising the Society about £100 per annum.

In February, 1857, the Society had £1,050 in hand; but the expense of changing its premises decreased this amount to the extent of £700 by December. Within two years of this time the entire funds were eaten up, and an expenditure in excess of income to the extent of £586 16s. 7d. had been made.

In May, 1857, an event worth chronicling occurred, as a proof of the good feeling that existed in the profession at this period. It was on the occasion of the death of Scott Archer, whose wife and family were left unprovided for, when the Society, led by Mr. Mayall, started a subscription which ultimately realised £747; and Sir William J. Newton, addressing an earnest appeal to the late Earl of Derby for a pension for the three orphans, obtained for them an annuity of £50.

At the exhibition of 1859 carbon prints were shown as a novelty, and alkaline gold-toning referred to. In the same year a "collodion" committee was appointed and issued a report.

During the session of 1860 and 1861 the Society lost its patron, the Prince Consort; but no other event of importance occurred. From the report of the Society for this year I extract the following sentence:—

"To the Royal Society there is yearly appointed a government grant of money to be expended in furthering scientific investigation for the benefit of the country. The Council of the Photographic Society, pointing only to the practical results hitherto attained under unfavourable circumstances, would venture to suggest that assistance should be granted by government towards improvements in the processes of photography. It would serve to determine many difficulties, and tend to increase advantages now derived from the various employments of the art in the different departments of the government. A yearly grant, if only a tithe of the money saved by substituting photographs for the mechanical drawings formerly made in all ordnance, naval, and other departments would stimulate advancement in the art and assuredly more than repay the expenditure."

In 1864 the carbon process of Mr. Swan was first introduced. The introduction of this process, which has since grown to such dimensions, was the occasion of a very large attendance and an animated discussion.

It is remarkable that in the address at the annual meeting of the Society for 1865 the Lord Chief Baron said:—"He entertained the same zeal for the progress of photography, whether as an art or a science, as he had ever done. Although he was not so young now, nor so able, perhaps, actively to illustrate that zeal, still he was capable of rendering them some service, and he hoped to save them some expense in a place for meeting." Then came these significant words, which I am particularly anxious to draw attention to:—"It was notorious that other societies with no higher claims to the assistance of government were provided with rooms at Burlington House. Almost every society with any claim whatever had rooms there. He purposed going there himself next day to ascertain how far, in point of fact, accommodation could be secured for this Society; and if he found a suitable room was to be had, he would make application to the members of government with whom the matter rested, and obtain sanction for this Society to be accommodated." In the same year Mr. Simpson introduced the useful and beautiful collodio-chloride process, and Mr. Woodbury, the photo-relief printing process.

It was at the exhibition of 1867 that the twelve photographs lent by the great French artist, photographer, and sculptor (M. Adam-Salomon) brought about what might be truly called a revolution in English portraiture.

The session 1868-69 was an important one. Sir Frederick Pollock retired on account of his age, being then in his 86th year, and Mr. James Glaisher, F.R.S., became President of the Society. At the annual meeting in February, 1868, he made a spirited address to the members, urging them to use every effort to put the Society in a good position financially, and had the gratification of seeing this effected within a short period. I quote a sentence from the address of the President on this occasion, as it shows the important part played by photography in its immediate connection with science:—

"Who could *feel* the value of photography more than himself? But for photography he or his assistants would frequently be workers and watchers all night long. The records of the registration of their instruments required taking once in every two hours; and little rest was obtained under such circumstances. They had to record the variations in movements so delicate that the finest spider's web was sufficient to arrest the motion. It could only be registered by an imponderable, and that imponderable was 'light,' and the process 'photography.' He could speak with much feeling and appreciation of what photography had done for science and for his own labours. They knew, too, that photography had a great future, and he hoped that each member would resolve to take his share in it."

At the next meeting of the Society another very interesting demonstration of the photo-relief printing process was given by Mr. Woodbury. I shall pass over the review of the last four years, considering its history is fresh in the memory of us all. Suffice it to say, that the Society has steadily progressed, its annual exhibitions have become increasingly popular, and its financial position good.

Having, then, taken this retrospect of the work of the Photographic Society, and traced its history, and, necessarily (to a great extent), the history of the progress of the art to the present time, let us now consider the best means that can be adopted for the future development of the art we love, and the part to be taken therein by "the Photographic Society of Great Britain." To rest upon our laurels, or, with Earl Russell, "rest and be thankful," cannot be the motto of a Society that represents so productive an art as ours; and until many things that now appear almost impossible not only become possible but practicable we cannot afford to entertain such an idea. It is this that has induced me to make certain suggestions the practicability of which, I trust, will be thoroughly discussed at this or some future meeting, and action taken thereon. For the sake of being explicit I shall divide my subject into three heads:—

1. The necessity of obtaining as soon as possible a royal charter, and thus possess the power of granting diplomas for merit.

2. Our claim upon the government for a money grant and suitable premises wherein to hold our meetings, exhibitions, and have permanent offices.

3. The necessity of forming committees for scientific investigation that shall annually report their results to the Society.

First, then, let us discuss "The necessity of obtaining as soon as possible a royal charter, and thus possess the power of granting diplomas for merit."

An attempt was made to obtain a royal charter some years since, but it proved unsuccessful from causes easy of explanation; this, however, is not likely to be the case again. The Society has gained its majority, holds a permanent position, and has by experience learnt how to make an annual exhibition self-supporting and keep itself out of debt. This alone proves its stability; and when we think of the number of branch societies scattered throughout the country it is a proof that the public interest in the art has not abated. Now that the country is demanding for its rising generation a more scientific and more extended education, and is beginning to wake up to the loss sustained in this country through its laxity in this direction, I think it is not an unsuitable occasion to present and urge our claims upon the government.

I shall now make suggestions as to the best way to go to work to obtain this desirable end; and in order to bring this matter immediately before the Council of this Society I shall at the forthcoming annual meeting propose the following motion:—"That it is the wish of this meeting that the Council shall immediately take into consideration whether it would not be for the interests of the Society to procure a charter of incorporation; and also that a special meeting of the Society be called as soon as possible to hear the report of the Council thereon, and pass any resolution that may be necessary in order to give the Council power to act."

Should this application prove successful, as I believe it would, if well supported, not only by this Society, but by the profession generally, then would arise the question of granting diplomas of merit—whether or not there should be two grades, such as "Fellows" and "Associates," or only "Fellows;" next, what kind of examination would be necessary prior to the honour being conferred, and also who should decide,

A suggestion was made many years ago by Mr. Cocking that the tribunal or electing body should consist of photographers, artists, and scientific men; and, in order to constitute such a body, Mr. Cocking adds:—"Let a certain number of such persons be elected by the entire body of photographers, and let them, through being granted a royal charter, have the power of conferring diplomas upon examination in artistic and manipulatory skill." This article, and also an interesting one upon the same subject by Mr. Jabez Hughes, will be found in the journals of December 20th, 1867.

It is admitted that, as a nation, we are much behindhand in art and art-culture. We have been called "a nation of shopkeepers;" but let the government wipe off this reproach by bestowng a royal charter and an annual grant and premises, and then the public will find that merit is recognised as it should be by a diploma. Those holding such diplomas would be patronised by the public, and thus confer a premium upon merit as well as greatly tend to educate the public eye and taste to that which is both artistic, truthful, and beautiful.

I now come to my second heading, viz:—"Our claim upon the government for a money grant and suitable premises wherein to hold our meetings, exhibitions, and have permanent offices." In order to prove the important position held by photography in the various departments of government I shall enumerate some of its establishments, its applications, and the benefit derived therefrom.

1. The Ordnance Survey Office at Southampton, under Sir Henry James, where zincography has for so many years been successfully practised, causing an immense saving to the country.

2. The Indian branch of the above, under Captain Waterhouse, R.A.

3. Greenwich Observatory, where the declination of the magnet is daily registered, and observations are made by our late President, Mr. James Glaisher, F.R.S.

4. Woolwich Arsenal, where all alterations in military drill and equipment, heavy ordnance, and designs of all kinds are photographed, resulting in a great saving of time and expense—such work having been so successfully executed by our President, Mr. John Spiller, F.C.S.; and now by our late Secretary, Mr. H. Baden Pritchard, F.C.S.

5. The Chatham School of Military Engineering, the photographic department being under our active and eminent member of Council, Captain Abney, R.E., F.C.S.

6. Again at Shoeburyness, where torpedo experiments are photographed instantaneously, and the effects of heavy shot upon iron plates most truthfully and efficiently depicted.

7. The photographic work at the South Kensington and British Museums.

8. The photographs of the pictures of the National Portrait Gallery [copies of which were sold by the government at a price that seriously affected the profession, decidedly an error of judgment and tending to depreciate the art].

9. Photographers were considered essential to the complete equipment of our armies during the two late wars in Abyssinia and on the Gold Coast. As respects other benefits derived from photography we may mention the part played by microphotography and the pigeon-post during the recent Franco-Prussian war. What thousands of families were made happy, both in London and Paris, through microphotography, as developed by M. Dagron during the eventful period, so that a full sheet of *The Times* was reproduced on a collodion film very little more than one inch square, and by the aid of pigeons conveyed from one quarter to another!

Again: the photographing of the recent transit of Venus has been an application to science the value of which cannot be overrated, not forgeting how useful the art was in photographing eclipses many years ago, for which an expedition was fitted out under the command of Colonel Tennant, R.E., and Mr. Norman Lockyer.

Photography has done much for science; has furthered art and many industries; has saved the government and the country tens of thousands of pounds, and (we believe) a serious rupture with an European nation, if the secrets of the Foreign Service were searched to ascertain the fact.

Su rely an art that has done so much for science as well as for industries deserves to be recognised by the government, and to receive some encouragement in order to further develope such useful investigations.

It is this that inclines me to suggest a call upon the government not only for an annual grant for scientific investigations, but also for premises to hold our meetings, our annual exhibitions, and permanent offices where a studio and all appliances necessary to a good establishment should be found, and instruction given to all desirous and willing to avail themselves of the same.

I now come to my third and last heading, viz.:—"The necessity of forming committees for scientific investigation that shall annually report their results to the Society."

In order to prove the necessity of such committees I mention a circumstance which occurred only last session.

Dr. Vogel asserted that "the red and yellow rays of the solar spectrum are capable of making an impression upon tinted collodion surfaces; that is, that a reddened collodion is sensitive to the red rays." Dr. van Monckhoven, Mr. John Spiller, and Mr. M. Carey Lea all dispute this position. Why not, then, settle the matter permanently by an experimental committee appointed for the purpose, as would be done by the French Academy of Sciences?

I would venture to suggest four subjects that might immediately be placed in the hands of committees, to be reported upon to this Society by the end of the session or the opening of the next.

1. "Whether a substitute cannot be found for albumen that will secure permanency to silver prints."

2. "How much nitric acid should be used in the negative bath to obtain the best results and secure regularity in working."

3. "Whether a dry-plate process cannot be perfected that shall be as rapid in its results as the present wet process."

4. "Whether, by employing a more sensitive agent than iodide or bromide of silver, instantaneous photography may not be achieved."

It is a notorious fact that many minds are at this moment employed working out certain problems. Why not make some arrangement whereby these may be brought together? and then we shall assuredly realise rapid and valuable results. There are many here that will bear me out in this assertion, and we have a continual proof of the same; for when anything new and valuable is published some one says—"I was at work at the same thing, and have been for years."

Let us, then, do our best to start these committees at once, and, if possible, have a committee in London and a committee in Liverpool or Edinburgh, working together in the same direction for the same objects, and communicate results.

Another suggestion I would make is "increased sociability." How can this be brought about? Some think by open-air meetings; but I believe John Bull is particularly fond of a good dinner-party. Charitable institutions raise thousands of pounds by dinners; why not try this plan with scientific institutions? It is true we have a chat over a cup of tea or coffee and a biscuit after every meeting; but what is this to an annual dinner with the Prince of Wales or Duke of Edinburgh in the chair! I fully believe in an annual dinner; let it be something after the style adopted by the Royal Academy and other societies.

Again: I think it a great pity that evening dress at our annual *soirée* was ever given up. Let these gatherings be opened with all the *éclat* possible; it helps to raise the status of the art in the eyes of the educatad public.

One suggestion as regards our ordinary monthly meetings. Nothing, I believe, is more interesting to members, or more likely to draw out discussion, than illustrations of anything that is new by a practical demonstration of the process. Every possible convenience is given for this to be done, and expense should not be spared.

I would just throw out the hint here that if every member brought a lady to our monthly meetings I think it would tend to increase the interest. It is well known that many ladies take a great interest in the art, and it might be the means of inducing some to join the Society.

Lastly: one word in favour of an annual congress of photographers, and the formation of a "British Photographic Congress."

I have both spoken and written in favour of such a scheme as most desirable; and although the Photographic Society of Great Britain has, I believe, a more useful field of labour before it, yet I feel the Society will willingly use all influence to further such a scheme, especially seeing that the photographic department of the British Association for the Advancement of Science is such a failure—and not unexpectedly so, seeing that photography, as still a young art, is only very partially understood by scientific men. They feel and know its importance, they see its results, but cannot enter into its failings practically, or lend a helping hand to its advancement.

It is one of those pursuits that require constant study as well as a lively interest in order to enter into its requirements and appreciate its usefulness and applications.

In conclusion: I again repeat the resolution it is my intention to move at the next annual meeting of the Society, and trust that it may lead to the adoption of some of the suggestions I have thought it right and proper to make. The resolution is as follows:—"That it is the wish of this meeting that the Council shall immediately take into consideration whether it would not be for the interests of the Society to procure a charter of incorporation; and also that a special meeting of the Society be called as soon as possible to hear the report of the Council thereon, and pass any resolution that may be necessary in order to give the Council power to act."

Geo. Hooper.

# Meetings of Societies.

## SOUTH LONDON PHOTOGRAPHIC SOCIETY.

A "popular meeting" of this Society was held at the House of the Society of Arts, on Thursday, the 14th inst., at which there was a large attendance of ladies and gentlemen. The Rev. F. F. Statham, F.G.S., occupied the chair.

The following new members were enrolled, viz., Messrs. E. F. Grainger, George Hare, H. Reynolds, R. Croisdale, and H. Azulay.

Mr. S. Fry exhibited a print from the negative of the President which he had shown at the Technical Exhibition, illustrative of the value of pre-lighting the negative.

Mr. J. Spiller, F.C.S., exhibited the nitre-sulphur light of which we gave some particulars last week, and an article descriptive of which will be found in the present number. Mr. Spiller further suggested the addition

of sal-prunella balls and shots of sulphur to keep up the continuity of the light. To show the purity of the flame, Mr. Spiller exhibited a card upon which were mounted a number of samples of various coloured silks, the brilliant colours of which were shown to great advantage. A vote of thanks was awarded to Mr. Spiller.

Messrs. W. H. Oakley and Co. exhibited on a large screen a great number of photographic transparencies as dissolving views, these transparencies having been brought by Messrs. Howard, York, Hunter, Kennett, and Ferneley. The value of this exhibition was greatly enhanced by a lucid description given by Mr. Gore of the views in India exhibited by Mr. York.

The proceedings closed at a late hour by the projection on the screen of the music and words of the national anthem, a verse of which was sung by the company.

After votes of thanks to Messrs. Oakley and the contributors of the pictures the proceedings terminated.

## WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.

This Society held its ordinary meeting on Monday, the 28th ult.,—the President, Mr. J. W. Gough, in the chair. There was a numerous attendance of ladies and gentlemen.

Mr. Manley, of Brighouse, had been announced to give a lantern exhibition; but having, at the last moment, withdrawn from the engagement, somewhat hurried steps had to be taken to supply his place.

Mr. Greaves, of Halifax, kindly sent his dissolving lantern, which was managed by Mr. W. E. Batho; and several friends supplied a number of transparencies, including many of Ferrier's and the Woodbury Company's. An admirable exhibition, occupying about an hour, was successfully accomplished. Several views of the Rhine, and others of the Yosemite Valley, were much admired.

The meeting then turned its attention to the formal business of the evening, viz., the discussion of the rules, and the passing thereof. The general rules with respect to officers and the management of the Society's ordinary business were passed without much discussion, except of an extremely conversational character, until the question of the Society's offering prizes for competition came on, which gave rise to numerous expressions of opinion.

The President proposed the following resolution:—"That the Society shall offer prizes for the best works in the various departments of photographic art, the exhibitors being required to state in writing if the work be their own artistic arrangement and manipulation, if prompted by advice, or acting under the direction or with the assistance of any person whose name does not appear in connection with it. The award shall not be deemed legal unless the works hung in competition shall have been reviewed, and a report presented as to their artistic merits by a competent and, if necessary, paid critic. Such reviewer to be selected at a general meeting of the Society."

Some of the members present expressed a fear that such a step at the present time might prove to be opposed to the real interests of the Society, seeing the great amount of dissatisfaction to which similar exhibitions had given rise, and spoke of the great tendency to favouriteism in the awards. Other members were of opinion that the welfare of the Society would be best secured by confining the exhibition to Yorkshire, premising that there were sufficient photographers of ability within its limits to produce a high-class exhibition.

The President urged upon the members the necessity of avoiding any such narrow feeling, and spoke of the danger of any "one-horse" policy. He (the President) was of opinion that the Society could only flourish by having a wider basis, and attracting to its ranks men of established reputation and ability, whose works would act as a spur to stir up the dormant talent already existing in many followers of their art-science; and that such an end could only be secured by comparing their own work with the productions of others, such comparison being the true test of ability. Further: unless the Society offered some reward for the successful competitors there was no inducement for persons at any distance to send works for exhibition.

It having been found that the subject could not be definitely settled that evening, it was resolved, on the motion of the Secretary, that the proposed rule should form the subject for discussion at the next meeting.

It was further resolved that the Society should hold its ordinary meetings on the first Monday in each month instead oi the last; that the January meeting be omitted; and that the next meeting be held on the 1st February next.

# Correspondence.

## THE SCIOPTICON LAMP.

*To the* Editors.

Gentlemen,—Having seen by the report in your Journal of the meeting of the Edinburgh Photographic Society, and in other articles, the description of a new lamp for the lantern, invented by Mr. Turnbull, of Edinburgh, and as that gentleman has thought fit in his description of it to bring forward the sciopticon light as a means of contrasting it, and showing the superiority of his own, I hope I may be allowed a few words on the subject. From the report of the Edinburgh Photographic Society I note that, after giving the candle power of various lights, he concludes them by adding—"Sciopticon, 42¼ candles; my own lamp, 58 candles," thus giving the latter over one-third more light than the former. Now for my say in the matter.

Seeing this new lamp advertised in your Journal for sale, I at once ordered one through an agent; but as until the last day or two I had been for some time confined to bed, I had no chance of trying it until today. This I have done by placing the two lights together, having, as recommended, added a small quantity of colza oil to the paraffine in the new lamp. The light from the sciopticon was simply that which came from the back of the lantern, no reflector or condenser being used in either case.

Result: two shadows thrown on the wall side by side, one having at least one-third more density than the other, viz., that thrown by the sciopticon, thus reversing the statement made at the meeting of the Edinburgh Photographic Society, and showing, notwithstanding the extra complication of the three wicks, a far greater power of light in the sciopticon, also a great contrast between the steadiness of the two lights.

In this experiment the new lamp had the great advantage of not being confined in a lantern box, which would tend, as the author says in his article in your Almanac, to obstruct the current of air, and so lessen the whiteness of the light obtained.

I shall be happy to prove what I have here stated to scientific gentlemen interested in the lantern, but not in the sale of it.

The use of three wicks, I may add, is no novelty, having been suggested to me from time to time during the past two years. The blower, which the author claims as his chief novelty, is nothing more than the bottom part of the flame chamber of the sciopticon made movable.—I am, yours, &c., Walter B. Woodbury.

*January* 18, 1875.

## AN EXPLOSIVE DEVELOPER.

*To the* Editors.

Gentlemen,—Some few months ago I performed a number of experiments with a view to determining the precise nature of the mechanical action of viscoidal bodies in the developer. Solutions of plain iron protosulphate were mixed with various organic bodies in quantities sufficient to bring them to the same degree of viscosity, as measured by an instrument adapted to the purpose. After the experiments the bottles were tightly corked and left on a shelf in my laboratory.

A few evenings ago I was startled by a loud explosion, which turned out to have been that of a bottle of developer rendered viscous by the addition of molasses. Probably fermentation had set in, and an accumulation of carbonic anhydride had burst the bottle with violence.

Moral: avoid the use of tight corks for bottles of developer containing fermentable organic bodies, or serious consequences may ensue.—I am, yours, &c., D. Winstanley.

*Blackpool, January* 16, 1875.

## REMBRANDT PORTRAITS, &c.

*To the* Editors.

Gentlemen,—In your report of the few remarks I made upon Mr. Bashford's very able paper read at a recent meeting of the Edinburgh Photographic Society, it is made to appear that I then and there condemned all and every kind of pictures taken with a side-light. This was not my intention, and I regret extremely that one word (literally *one word*) should have escaped my lips calculated to give offence to any one who makes that particular style of photography a speciality.

Indeed, all that I intended to have said was that, in my humble opinion, Sir Thomas Lawrence's soft, sunny mode of lighting his portraits gave a more agreeable representation of the human face than the very strong and effective contrast of light and shadow occasionally found in the portraits by Rembrandt.

I have just seen Mr. A. W. Steele's communication in last week's Journal, which is certainly written in a far less bitter and sarcastic manner than several private letters that gentleman has lately favoured me with. Still, I must decline to give any further reason for my decision in his unfortunate lawsuit than what I have already given to the satisfaction of the judge who tried the case.—I am, yours, &c.,

114, *George-street, Edinburgh,* James Ross.

*January* 19, 1875.

## *RE* GELATINO-BROMIDE.

*To the* Editors.

Gentlemen,—I have read with some pain the remarks on Mr. Kennett—so well known in connection with gelatino-pellicle emulsions—made by Dr. Nicol in his otherwise interesting and amusing review of the past photographic year given in your issue of last week. They appear to my mind wholly uncalled-for, and to bear undeservedly hard on one who has certainly made a valuable contribution to the photographer's *repertoire.* Whether Dr. Nicol does or does not repudiate patent law entirely I do

not know; but even if he does—and he has a host of good men with him in this view—it seems scarcely fair or reasonable to blame Mr. Kennett for taking advantage of the rights which the law, as it exists, gives him.

That Mr. Kennett is the author of a substantive invention is admitted by Dr. Nicol, for he says, speaking of gelatine:—"Emulsions were uncertain, and subject to rapid variation; but Mr. Kennett hit on the idea of drying it into a pellicle which needed only to be dissolved in water to be ready for use." Why, therefore, he should complain of Mr. Kennett patenting his invention is not very obvious, or why, indeed, he should proceed to condemn everybody who runs to the Patent Office with what he (Dr. Nicol) is pleased to term "a trifling improvement" in terms which, by implication, includes Mr. Kennett's.

Now, what is or is not "a trifling improvement" depends on the circumstances of the case. It is of constant occurrence that processes, however good in principle, are good only to a certain point, but fail to be thoroughly practical till some one invents what is needed, and puts the finishing touch to it by what appears to some to be a "very trifling" affair—a something, however, which perfects the process and renders it at once available for use. So with Mr. Kennett. Gelatine emulsions were known, but failed to meet all requirements; but Mr. Kennett invented—"hit on the idea," as Dr. Nicol expresses it—of a preparation which got over the difficulty, and entirely fulfilled the requirements. Surely this can scarcely be called "a trifling improvement," and it seems somewhat hard to hold Mr. Kennett up to public scorn for taking advantage of the means which the law of his country, like the law of most civilised countries, places at his disposal for securing a property in the creation of his brain.

It seems just now too much the fashion among the writers in the photographic journals to deprecate the taking out of photographic patents. It seems to me a most legitimate course to pursue. The policy which may lead any one to do this must rest with the individual. It may be foolish or it may not; at all events, to my mind at least, it appears not only legitimate but thoroughly honest and honourable.

Again: is it quite fair on the part of Dr. Nicol to carry his pet antipathy to patentees so far as to encourage infringement of Mr. Kennett's rights? Is it reasonable to assure his brother photographers that they may infringe them with impunity, thus pronouncing that the patent is invalid? I trust that before any of them are so rash as to act on Dr. Nicol's infallible decree they will take the precaution of consulting their legal adviser, or they may find themselves in an unpleasant predicament if Mr. Kennett should think it worth his while to take action against them. As an old legal practitioner I should hesitate to give an offhand legal opinion on the validity or non-validity of any patent; but, alas! it is remarkable, and would be amusing if the matter were not too serious for a joke, to see how ready at a moment's notice the non-legal man is to pronounce with an air of infallibility decided opinions on intricate questions involving legal learning, legal study, and legal practice.

Dr. Nicol admits Mr. Kennett to be the inventor, and that the invention is good, and yet, with singular inconsistency, because he has patented it he (Dr. Nicol), by way of showing his gratitude, pronounces sentence of outlawry on his benefactor.—I am, yours, &c.,

*January* 18, 1875. P. Le Neve Foster.

## "THE NEW LENS."

*To the* Editors.

Gentlemen,—We are sorry to trouble you again upon the subject of the new lens, but cannot let Mr. Dallmeyer's letter in your last impression pass without comment. It is rather surprising that Mr. Dallmeyer has adopted in his "final rejoinder" such a damaging course as to place the matter entirely against himself; but we have no doubt he has found it very difficult, indeed, to come out of this slight affray without some regret for having commenced it.

Mr. Dallmeyer says:—"My action in regard to the former correspondence referred to by Messrs. Murray and Heath is easily explained. At that time I had reason to believe that Messrs. Steinheil were infringing my patent, and I intimated my intention of obtaining an injunction, when, on the mediation of a common friend, Dr. van Monckhoven, I was induced to leave the matter in abeyance." From the foregoing this question must arise—Why did Mr. Dallmeyer leave the matter "*in abeyance?*" Surely not because of any friendly feeling towards Messrs. Steinheil or ourselves; for, if so, why should that gentleman have shown such an amount of eagerness to claim most emphatically the right of invention of the "new" lens *upon precisely the same grounds as before?* No! to us the reason is palpable. At the time referred to he must have been convinced that a prior claim *was* due, without the slightest doubt, to Messrs. Steinheil, and in writing his letter of November 27, 1874, the early correspondence was ignored, with probably the hope that we should do the same.

Mr. Dallmeyer continues:—"The publication to which Messrs. Steinheil refer gives them priority for the construction of a system of lenses the combination of which are respectively composed of two *separate* elements, viz., flint and crown, not cemented." This is very kind on his part to acknowledge; but why ignore the further fact that to them is due the priority of using the same elements—that is, the denser material occupying the outward positions—cemented?

Mr. Dallmeyer specially states one of his claims to be for "the constructing of lenses composed of two positive achromatic or actinic combinations, of which the higher-refracting denser material, or flint glass lens, occupies the external or exterior position in each combination." Will it surprise Mr. Dallmeyer if we now inform him—which we have not before done—that *at the time he applied for his patent, and for a long time anterior*, there was lying upon the table of the public reading-room in the Patent Office here in London, and open to the inspection of the public, a volume of the Commissioners of Patents' *Journal* containing these precise words:—"Dr. K. A. and Dr. H. A. Steinheil, of Munich, for obtaining symmetrical and achromatic object-glasses the first and last lens of which consists of flint glass or semi-flint.—Dated January 19th, 1865." This information having been accessible to the English-reading public since its publication in the before-mentioned *Journal* on March 6th, 1866, Mr. Dallmeyer cannot now fail to see that ere *his* claim can be substantiated he will have to prove two things—first, that such publication as that which we have quoted has not been made; and second, that the date "September 27th, 1866," of his patent is really anterior to either January 19th, 1865, or even to March 6th, 1866. When this has been done it will be time enough for us to show in what other respects his patent fails to come up to the requirements of the English patent laws.

We are certainly amused at Mr. Dallmeyer's concluding remarks. It is now very easy to say that he has made no attack; but we simply beg to differ with him, and will only take this opportunity of further endorsing what we have previously said.

In conclusion: allow us most distinctly to assure Mr. Dallmeyer that we have no intention whatever of withdrawing from the introduction of these lenses; and, if he be still so ill-advised on the "best authority" (?) as to wish the matter settled by a legal tribunal, then so be it. We shall at all times be as ready as now to defend the rights of Messrs. Steinheil and ourselves to the utmost.—We are, yours, &c.,

69, *Jermyn-street, London, S. W.,* Murray and Heath.
*January* 18, 1875.

*To the* Editors.

Gentlemen,—Although we fully agree in all Mr. Wenham has written about the invalidity of Mr. Dallmeyer's patent we, nevertheless, think it necessary, before the discussion closes, to place on record the following facts, viz., that several years before the date of Mr. Dallmeyer's patent we manufactured, advertised, and sold compound lenses *having the denser element or flint glass outside.* We send you herewith one of the identical lenses to satisfy you as to the correctness of our statement. So much for the *denser element outside*, which is unquestionably the backbone of Mr. Dallmeyer's patent.

With regard to his claim for the back lens being of less diameter than the front one we content ourselves by simply stating that in a series of lenses introduced by us in 1864 (two years anterior to Mr. Dallmeyer's patent), and still made and catalogued by us, the back lens is not only considerably less in diameter, but is also shorter in focus, than the front one. We likewise send you three sizes of these lenses for your inspection. So much for this other important claim in Mr. Dallmeyer's patent.

From the foregoing you will not consider it surprising that we fail to recognise the value of patents of the class referred to, and publicly avow our intention of not allowing ourselves to be influenced by them in the slightest degree.—We are, yours, &c., Ross and Co.

7, *Wigmore-street, Cavendish-square, W.,*
*January* 19, 1875.

[All parties having been heard we now close the discussion. There was no necessity for Messrs. Ross and Co. to send for inspection the lenses referred to in their letter, as we have been for many years aware that Mr. Thomas Ross made numerous lenses fulfilling the conditions of the "denser elements being placed outside." Without interfering in the slightest degree in the optical discussion now closed, we may state, as a mere matter of fact, that when reviewing, in 1865, some lenses sent to us by M. Darlot's Liverpool agent, we said that they differed from Ross's doublet to this extent, at anyrate, that whereas in the latter, in which the flint element is placed *outside* in the back lens and *inside* in the front one, in Darlot's doublet the flint of the front lens was placed outside. Mr. Ross called upon us immediately upon the publication of that number of the Journal, and by the production of a lens taken from his stock demonstrated to us, in the most unmistakable manner, that he also had manufactured doublets with the denser elements to the outside, although, for a reason he then gave, he did not consider this arrangement quite so good as that which he had adopted the previous year, and which, he said, he would continue to adopt in all save exceptional cases. We may further state that the same gentleman testified to the soundness of the theory enunciated in our columns by Mr. R. H. Bow, C.E., of Edinburgh, who, when "laying down the law" upon which non-distorting lenses must be manufactured (see page 441 of our volume for 1861), says, when speaking of the construction of compound lenses:—"Suppose that the copy is

to be in size $\frac{1}{m}$th of the original; then I make all the dimensions and distances of the parts on the chart side" (the front) "of the stop equal to *m* times the corresponding dimensions and distances on the *copy*" (ground glass) "side of the stop." Mr. Bow illustrated this by a diagram showing a larger front lens than a back lens, the focus of the larger being longer than that of the smaller lens. Mr. Thomas Ross constructed many of his doublets on this principle; and we have long possessed one of much excellence in which the front lens is larger than the back lens, in accordance with the principle laid down by Mr. Bow. A word in conclusion: we think our great opticians—whether theoretical or practical, whether home or foreign—can, in this matter, afford to take a *broad* view of the subject and stand upon their respective merits, rather than go out of the way to ask the opinion of the Vice-Chancellor, who, while strictly adjudicating in any case arising out of prior, contemporaneous, or post invention according to law would, we feel assured, entertain the same view as we do that "there's room enough for all."—Eds.]

## "SUTTON'S PATENT ALBUMENIZED PAPER."

*To the* Editors.

Gentlemen,—In The British Journal Photographic Almanac for the present year there appears an advertisement from Messrs. Ordish and Co. with the following announcement:—"Sole agents by special appointment for Sutton's patent albumenized papers." Kindly permit me to say that the statement to which I call your attention is entirely false from beginning to end, and that I have instructed my solicitor to take the necessary proceedings to punish the authors of it.

I bought Mr. Sutton's patent years ago for £100, and, in addition, I paid his patent agent's bill. Subsequently Mr. Sutton was employed by me for several years in giving the paper its preliminary coating before I placed it in the hands of my work-people for albumenising.

It is, therefore, self-evident that Messrs. Ordish and Co. cannot be "sole agents," "by special appointment" or otherwise, and that I am justified in calling the attention of the profession to this misstatement, the author of which I am about to ask the Court of Chancery to punish.—I am, yours, &c., T. Lampray.

83, *Gaisford-street, N. W., January* 20, 1875.

## EXCHANGE COLUMN.

Large lantern, with six-inch condenser, lamp, &c., and a few slides, in exchange for Weston's rotary burnisher, cabinet size.—Address, D. Johnston, Forres, Morayshire.

I will exchange a Cusson's posing chair, two backs, davenport, seven changes, and an ivory background for other furniture; difference adjusted.—Address, F. Edwards, Maldon, Essex.

I will exchange a very good 5 × 4 doublet lens, by Ross, for a square bellows camera (swing back preferred) for in or outdoor work. Difference in cash.—Address, G. Hadley, 42, Union-terrace, York.

Wanted to exchange a really good cabinet portrait lens, central diaphragm, for a pair of gas bags in good condition, to hold not less than six feet each, and pressure-boards.—Address, G. W. Taylor, Doncaster.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

D. Winstanley.—Thanks.

B. J. Edwards.—Received. Thanks.

Acadie.—The biunial form is most convenient.

J. M'L.—We have not had time to make further experiments.

G. W. T.—Add sulphuric acid to throw down the lead in the form of the sulphate.

B. L. M.—The papers received have been coated with gelatine with which a pigment had been mixed.

James F. Cowee (Troy, New York).—Post-office order for 19s. 1d. to hand, which balances the account.

Emulsion.—Probably you are not aware that emulsion of the kind you require is now an article of commerce.

. G.—Can you send us the circular to which reference is made? We should then be better able to understand the matter.

James Valentine (Dundee).—Our correspondent has sent us his new catalogue of photographic publications. It contains forty pages.

Scotus.—We have an instrument similar to that which you describe, by means of which both eyes may be employed. We may hereafter give a description of this instrument.

A Dabbler.—We cannot in this column give you instructions how to make chloride of gold; nor is it necessary, inasmuch as detailed directions may be found in any good work on chemistry.

C. Pearson, Jun.—1. For landscape work and dry plates the portable camera referred to will answer well; but it is not so suitable for the wet process.—2. The lens indicated will answer admirably.

J. Werge.—From Mr. Werge, of Berners-street, we have received a new pamphlet issued by him (and illustrated by an excellent photograph) on *Pictorial Backgrounds, and How to Produce Them.* In this pamphlet is elaborated the instructions previously published by Mr. Werge in this Journal. We commend the *brochure* to our readers.

Cheshire.—1. For stability the collodio-albumen process leaves nothing to be desired.—2. Rapidity depends not upon the collodion substratum, but upon the albumen, together with the method of development to be employed. A very brief exposure necessitates the employment of an alkaline developer.—3. Not that we are aware of.—4. Mix the aurine with brown, hard, spirit varnish, and then apply it to the globe by means of a large flat camel's-hair brush, having previously warmed the globe.

Erratum.—Mr. Herbert B. Berkeley directs our attention to a verbal error of some importance in his article at page 49 of the Almanac. Instead of adding water "sufficient to make up *four* ounces," as directed in the eighth line from the bottom of page 50, the quantity must only be *one* ounce. Mr. Berkeley adds—"It may be well to mention that I do not find it *necessary* to use as much as nine grains of pyrogallic acid to the ounce of developer. I have given them in the formula to show that the plates will bear a very strong developer. Perhaps you will kindly give this letter a place in your Journal, in order that, at least, some of the readers of the Almanac may be able to rectify the mistake in their copies."

Young Amateur (Naples).—1. The proverbial blue skies of your country doubtless prevent you from getting the opacity you desire.—Prepare your collodion with iodide and bromide of ammonium in the proportion of three and a-half grains of the former and one and a-half grain of the latter to each ounce, using a twenty-grain iron developer.—3. The experiment may easily be tried.—4. Try No. 1 of the toning formulæ given in our Almanac for this year. We have never experienced the difficulty mentioned by you in respect of transferring a carbon print.—5. There are several methods by which a square picture could be copied into an oblong shape; among these are the placing of the picture at a slope backwards, or the employment of a cylindrical or distorting lens.—6. Three.—7. We cannot tell.—8. The amount received was 8s. 1d. The postage is 3d., hence the charge for each number of the Journal is 6d. The Almanacs for 1874 and 1875 have been dispatched. The cost of each Almanac, including postage, is 2s. Your remittance has balanced up to this week. Please remit in course of post if you desire the Journal to be continued.

The Late O. G. Rejlander.—It is our painful duty to announce the decease of Mr. O. G. Rejlander, which took place at his residence in Clapham on Monday last, the 18th inst. The melancholy intelligence has only reached us as we are preparing for press, so we must defer till next week a more lengthened obituary notice of the deceased gentleman. Mr. Rejlander was an *artist* in the proper sense of the term—indeed, his feeling for art far surpassed the manipulative power he possessed in the practice of photography. He was the first photographic artist to embody—as he did in his *Two Ways of Life*—an original conception in what are designated "combination pictures." Although this style of picture has given rise to much controversy as to the capability of photography for carrying out art-ideas in that direction, still Mr. Rejlander has proved that a true artist need be but little fettered by the mechanical operations connected with photography. In seeking his models no trouble was too great, nor was any subject too insignificant, if his acute artistic sense but caught the germ of an idea. Numerous are the anecdotes which could be related of him did time permit, for he was well known not only as an artist, but also as a keen humorist, a genial companion, and a generous friend—ever ready to lend a helping hand wherever aid was needed. The ranks of photography may have lost more practical men, but never a more ardent supporter of the claims of the camera as an artistic aid, nor one who, by his example, has done more to give force to those claims. We may have next week to allude to his circumstances at the time of his decease. Poor Rejlander was an enthusiast, and, like all such, thought more of art than of pecuniary advantage.

## METEOROLOGICAL REPORT,

*For the Week ending January* 20, 1875.

Observations taken at 406, Strand, by J. H. Steward, Optician.

These Observations are Taken at 8.30 a.m.

| Dec. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 14 | 30·06 | SW | 48 | 50 | 53 | 47 | Raining |
| 15 | 29·94 | S | 47 | 48 | 53 | 47 | Cloudy |
| 16 | 29·60 | SW | 47 | 47 | 52 | 47 | Raining |
| 18 | 29·77 | W | 51 | 52 | 54 | 47 | Raining |
| 19 | 29·90 | W | 48 | 50 | 54 | 48 | Cloudy |
| 20 | 29·71 | W | 47 | 50 | — | 49 | Cloudy |

CONTENTS.

# THE BRITISH JOURNAL OF PHOTOGRAPHY.

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## THE MICRO-LANTERN.

We preface what we have to say by narrating a simple incident. We recently exhibited to some scientific friends, by means of the lantern, a few of the special class of microscopic objects known as "whole insects." One of the gentlemen present was an expert in this peculiar direction, and he speedily realised, and directed attention to, the fact that the definition at the extreme margin, as well as at the centre, was sharp to a degree he had never previously seen under similar circumstances, while the intensity of the illumination was also much greater. The means employed for effecting this will be ascertained from what is to follow.

It is very easy to project an enlarged image of a minute object when the sole purpose of such projection is the photographing of the object; but it is an entirely different and much more difficult matter to project it in a manner suited to visual examination, especially by a number of persons simultaneously. Definition irrespective of illumination is the chief requirement in the former case; definition *with* illumination is absolutely necessary in the latter. The former can be obtained by curtailing the aperture of the object-glass and giving a longer exposure; in the latter case no such curtailment of the objective can be tolerated, inasmuch as the enlarged image is finally to be projected on the human retina, and not upon a sensitive plate, in relation to which feebleness of lighting can be compensated by prolongation of exposure. For ocular purposes the enlarged image of the microscopic object must be both sharp and luminous.

No well-constructed microscopic object-glass we have ever seen possesses the ability, so to speak, of producing on the screen an image at once sharp, flat, and of great area. What two-inch power is there that can enlarge in a thoroughly satisfactory manner an object of dimensions approaching the size of a threepenny-piece? And yet, with a power not much lower than that we have shown, brilliantly illuminated from edge to edge, an object of nearly the size of half-a-crown on a six-foot screen.

Discarding the usual microscopic low powers we have now adopted with increased advantages an objective constructed on the same principle as the well-known portrait combination, very short in focus, and with a large aperture in comparison with its focal power. The tube in which the lenses are mounted is very short, so as to permit of the passage of a ray at a great degree of obliquity to the axis. This enables the objective to cover a large field, or, speaking inversely, to project an image of large dimensions compared with its focal power. But no one who has bestowed attention upon the transmission of large oblique pencils will fail to see that if the object to be enlarged were mounted upon a flat glass the astigmation would be so great that, while there would be plenty of light, there would be no marginal definition worthy of the term in the enlarged image. This is quite true; hence we will afford some explanation of the manner by which we so managed that, whereas by one of the usual microscopic objectives only one extended wing of a grasshopper was shown on the screen, we showed not only one wing, but also the body and the second wing, and not only the whole of the one insect or fly, but the whole of three of them which were mounted on one slide, and this with such good marginal definition as to permit the spectators to advance to the screen and examine the details through hand magnifying-glasses.

There is sold in the watch-glass makers' shops in Clerkenwell a foreign-made watch glass of a peculiar kind, and known in the trade as "concave crystals." The price we paid was at the rate of five shillings a dozen, or more than six times that at which ordinary lunette glasses can be obtained when purchased in quantities. They are stout and strong, the edges finely polished, and they are curved, spherically, to a very slight degree. The diameter of those we obtained was an inch and a-half, and, instead of mounting the objects which were intended to be subsequently magnified between two circular but *flat* glasses as usual, we mounted them between two of these "concave crystals." Here was the whole secret. The two glasses must be placed "spoon fashion," and the object being between them is bent in a gentle curve. With objects mounted in this way, and employing an objective of the kind we have just described—what is known by photographers as a "locket portrait combination" will answer well if of short focus—the lime light need no longer be regarded as an indispensable requisite in the showing of microscopic objects; for with a good lamp burning paraffine oil a disc of six feet may very easily be obtained.

Hitherto we have spoken of natural objects. But in practice we have also used this arrangement in connection with photography, both in obtaining pictures, with large aperture, which should be microscopically sharp all over the area of delineation, and, conversely, of producing enlargements from pictures thus obtained. As respects the exposure required to produce an absolutely sharp picture it is, compared with that which is necessary on a flat plate, less than half; because in the latter case a stop must be used to secure intense definition at the margin, hence if proper mechanical contrivances be adopted for effecting a rapid exposure there will be no difficulty in taking a fully-exposed negative of any scene in which instantaneity is a pre-requisite, the picture afterwards bearing a great degree of enlargement. After several trials we can assert with confidence that the manipulation of a circular and slightly concave surface is quite as easy as that of a flat glass.

## ON PHOTOGRAPHIC PAPER.

Having in a previous article given a brief description of the process of paper-making as carried on in the best equipped mills of the present time, we are now in a position to consider how far the machinery and methods are suitable for the production of photographic paper. Before doing so, however, we wish to correct an error which crept into our description of the knotting engine. The frames are not covered with wire gauze, as we were made to say, but with brass plates, in which parallel slits have been cut with an exceedingly fine circular saw. We consider this correction important, as a first principle in paper-making is the fact that the pulp will not pass through the gauze, although it can readily be sucked through the slits.

A good photographic paper, or paper suitable for silver printing, must possess at least three qualities—sufficient toughness to bear

without tearing the necessary amount of washing to which it is subjected during the various stages of the process of printing, purity of colour, and perfect freedom from metallic particles. The first quality is best secured by the exclusive use of linen rags—the fine, circular, tube-like lint fibre, being apparently better adapted for felting than the coarse, flattened, jointed-looking cotton fibre, and thereby, weight for weight, giving a much tougher paper. The colour may also be easily arrived at—first by carefully selecting only white rags, and then by suitable cleaning; and as in general no process of bleaching would be necessary there need be no fear of retained chlorine, or "antichlor." The third requirement is, however, a very different matter; and we may say at once that it is one which cannot be attained with the machinery at present in use in our modern paper mills.

The beauty and perfection of that machinery is the admiration of all who see it; but, just in proportion to its perfection for the production of even the very finest qualities of ordinary paper, so is it unsuitable for the manufacture of the paper in question. During the whole process, from the rags, as they go to the "devil," to the cutting up of the paper into the required sizes, the material is almost constantly in contact with iron, either as cast or steel. This of course—especially where the motion is very rapid, or where two surfaces come into contact—is liable to constant abrasion, the abraded particles getting mixed with the pulp, and ultimately becoming part and parcel of the finished article. Although these particles are so fine as to be invisible to the naked eye, and harmless in ordinary paper, they unmistakably show themselves in photographic paper whenever it is floated on the sensitising bath.

The remedy, we need hardly say, is obvious. If our manufacturers wish to make a good photographic paper they must get rid of iron altogether, and substitute brass or gun metal where metal is absolutely necessary, such as in the cutters of the beating-roll. The beating-roll itself and the troughs of the beating and poaching engines should be of wood, as indeed should everything else whereever it can be made to answer the purpose. This, of course, almost involves the entire reconstruction of the mill, or, better still, the erection of a new mill on the principles of half-a-century ago—a course which our paper-makers, with their go-ahead notions, could only be induced to take by something like an assurance that such a step would pay; but we fear, after a somewhat careful consideration, it will be found that no such assurance can be given.

We may fairly assume that nearly all the photographic paper consumed in the world is the produce of two makers—Blanchet Freres, in Rives, and Steinbach, in Malmedy—and that the quantity produced is pretty fairly divided between them. Now, on the authority of Dr. Vogel, we have it stated that the former turns out something like fifteen hundred reams per week, which, at say twenty pounds, is equal to a little over thirteen tons—an output that would hardly satisfy even the smaller mills in this country, and not, even if the whole trade of both establishments could be at once appropriated, sufficient to satisfy the proprietors of some of the larger works.

It will thus be evident that there is nothing derogatory to the ability or enterprise of our paper-makers in the fact that we are still dependent on two foreign makers for our supply of photographic paper; and, as we are supplied with, on the whole, a pretty good article, the only possible cause of complaint is that the partial monopoly may cause the price to be a little higher than it would be if the manufacture of photographic paper were in a greater number of hands. This, we are glad to hear, is likely soon to be remedied, as at Hütten, in Saxony, there has been erected a mill in every way suited for the production of photographic paper of the best quality; and we are told that the company are determined to produce only a high-class article, and at a moderate price.

Of course it will be understood that our observations in these articles apply only to paper for silver printing, as we are aware that paper admirably adapted for most of the processes of printing in carbon is made by many of our English and Scotch paper-makers. We shall next week conclude our articles on this subject by an account of some experiments on a source of fading to which we have already alluded.

## ON HOBBIES.

This is the third and last article *On Hobbies*, intended more especially for the consideration of amateurs and intending amateurs of our delightful art. In the two preceding articles we have endeavoured to show that the processes in common use amongst professional photographic portraitists—that is to say, the wet collodion process with a nitrate bath and iron developer, and silver printing upon albumenised paper—are not at all adapted to meet the wants of an amateur whose object is to take views on a country excursion. We have also endeavoured to show that the common modes of preparing dry plates are equally unsuitable to his purpose, whilst commercial dry plates are expensive and liable to innumerable special troubles and accidents and to be spoiled in the development.

In all the above methods of working there are *chemical* as well as mechanical difficulties to surmount, which make photography as a hobby a costly and a troublesome one, scarcely yielding results which to an amateur are worth the pains of obtaining, since they involve the labour of years, and a vast amount of disappointment to be gone through in acquiring the necessary proficiency. This being the case, we have suggested to amateurs to have nothing to say at first to any of the processes above named, but to confine themselves to those which involve no *chemical* difficulties at all, but only such neat manipulation as may be quickly acquired by any intelligent person having an aptitude for this kind of work. The processes to which we allude as strictly fulfilling this condition are—a new dry collodion process in which a permanent collodio-bromide emulsion is used, which can be purchased ready made, and which only requires to be poured upon the plate, at any convenient time or place in the course of a journey, to render it sensitive and ready for exposure; and carbon printing, in all its various and interesting applications to paper, glass, porcelain, &c. Having ventured to give this general advice to amateur photographers, it now remains for us to enter more into detail.

The first consideration with an amateur, or intending amateur, must be upon what scale he intends to work. He goes, perhaps, to an exhibition of photographs, where pictures of all sizes and shapes are hanging upon the walls and screens, or arranged upon tables, and makes up his mind, probably, that the largest are the best, and that no matter what size of picture he may elect to take at first he must ultimately aspire to large ones. Now we think this a mistake, and we counsel amateurs, from the very first, to adhere to a small size of negative; for we venture to say that, however large a paper photograph may be, it is not to be compared in point of beauty with a glass transparency of one-tenth the area, viewed in a suitable manner through a magnifying lens. On this subject hear what Professor Piazzi Smyth, Astronomer-Royal for Scotland, and one of our cleverest amateur photographers, has to say in an admirable article by him in this year's British Journal Photographic Almanac, at page 39:—

"I may confidently aver that I have tried photographs large and small, paper and waxed paper, mounted on cardboard and not mounted at all, bound in books and loose in portfolios, on glass, on porcelain, and on metal, but care not now to have copies of my negatives in any other way than as glass transparencies, keeping them in grooved wooden boxes, duly titled, packed away on the shelves of a bookcase, and as easily referred to as the books that are therein."

And then he goes on to tell us that he does not now care for negatives larger than a stereoscopic plate, and explains how prints from these upon glass may be viewed as transparencies with one eye only, giving, to quote again his own words—

"Such scenes of gorgeous sunlight and summer splendour as no paper prints of even the most unwieldy dimensions need ever hope to compete with."

Here, then, we have the experience of one of the oldest and ablest amateurs, whose eye for focus and detail must have been specially educated by his astronomical studies and experiments, and who has worked at photography at the Peak of Teneriffe, in the Great Pyramid, and many interesting places in Greece, Italy, Sicily, &c. The advice of such a man must surely be worth listening to; and that which we are now giving to amateurs is but the echo of it,

though arrived at quite independently, and before we had seen the interesting communication from which we quote.

Let the amateur, therefore, begin with plates not larger than quarter-plate. The camera should have a bellows body, should pull out from about two and a-half inches to about seven inches, and should be fitted with two or three view lenses having different focal lengths. For stereoscopic views take a pair of separate negatives by shifting through a suitable distance the legs of the tripod. This will often lead to a better result than by working in a binocular camera, because it will be found in a large number of cases that the distance between the stations should be taken wider apart than a twin-lens camera permits. On this subject so many eminent men have now pronounced an opinion opposed to that of Sir David Brewster that the question of the proper distance between the stations must be regarded as set at rest. That distance must depend upon the nature of the subject, and not at all upon the distance between the eyes of the spectator. Consult an excellent article by Mr. Wenham, in our ALMANAC for last year, on taking stereoscopic pictures.

Respecting the size of his negative, the amateur must bear in mind that the cost of a negative is at least proportional to its area for mere material, and may be vastly more than this for a variety of reasons involving extra risk, carriage, &c. Thus a negative $12 \times 10$ will cost at least ten times as much as one three and a-half inches square; and it is probable that, when all considerations are included, an amateur would find that for every shilling spent in taking the latter size of negative he would have to spend a sovereign in taking negatives of the former and larger size. Imagine one's hobby costing twenty times as much, and the results being but little, if at all, finer, and at the same time quite unsuitable for many charming applications, which we shall have to discuss presently, when we come to the subject of printing from them in carbon.

The tourist would take with him clean plates, coated with an albumen substratum, and packed in contact. When it was required to make some of these sensitive for a day's work he would hang a yellow calico before the bedroom window of his hotel, coat them with his sensitive emulsion, and put them at once into the dark slides. The development would be effected by the alkaline method, at any convenient opportunity; meantime, or after the development, they could be packed in pairs, with a thin frame of cardboard between, and tied together with string. This would be, indeed, photography made easy. But beware of a too *rapid* emulsion, for this, we much fear, will prove to be a delusion and a snare, and lead to many failures when collodion is the vehicle employed. Adhere to slow plates, and give long exposures. The emulsion itself may be coloured so as to do away with the necessity for any red pigment at the back of the plate in order to prevent blurring.

And now we come to the printing. Here the carbon process may advantageously be employed. Nothing but a little dexterous manipulation is required, and there are no chemical difficulties whatever, since all the materials can be purchased ready prepared. The process by double transfer will be found extremely simple and suitable for an amateur, as it can be performed within a very small space and makes no mess at all. But this is only suitable for paper prints. For glass transparencies the carbon printing process is the very simplest that has ever been devised, and the results are all that can be desired. If preferred they can be coloured at the back, and be looked *at* instead of through, by a method pointed out by Mr. Sutton about a year ago, and by which most charming effects can be produced.

Thus an amateur, by working in the way which we suggest, can take small negatives which will yield either magic lantern slides or transparencies or carbon enamels, coloured or uncoloured, or very pretty paper prints, which will be quite permanent and of any colour to suit his own taste. He can also take most effective stereoscopic views of the usual size either upon paper or glass; and all this at a very small cost for materials and transport, and with no knowledge of chemistry being required, and no failures arising from chemical causes. Surely, then, in photography thus practised we have a most charming hobby, exactly adapted to the requirements of an artist and a man of taste, who wishes for *souvenirs* of the various beautiful spots which it may be his good fortune to visit on a tour, or of any other objects which, for any reason whatever, may have a special interest for him. His hobby will be a relaxation from the ordinary cares of life; it will keep him upon his legs, will take him into the open air, will be a most rational and innocent one, will improve his taste and sharpen his appreciation of the beautiful, and will be a source also, in its results, of great delight to his friends.

Let us hope that these considerations may deter some who have become weary of the old tiresome processes from throwing photography up, and may attract many others to the ranks of amateurs.

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THE hand of Death has been laid upon the rank of photographers with more than usual severity this month. The death of Mr. Watkins we have already chronicled. That of Mr. O. G. Rejlander, alluded to in our last, has received fuller notice in another column. On the same day (the 18th inst.) upon which Mr. Rejlander died an amateur photographer, well known to many in London, although he kept aloof from societies, Mr. Samuel Guppy, died at a ripe age. His death was sudden; retiring as usual at night he was found dead in bed the following morning. During the past year or two he had discarded practical photography in favour of inquiries into spiritualism—a subject with which his name has been latterly intimately connected. Then, again, we have to record the death of Mr. William Swatman, whose name will be familiar to the profession as that of a skilful background painter. Mr. Henry Tesch, also well known in some circles as a teacher of the French and German languages, and in others as an operative photographer, died a short time ago from the result of a rupture occasioned by an unusual strain in taking down a heavy camera from a shelf. He was by birth a German, and is said to have been well connected. He was a man possessing undoubtedly much and varied information, but there seemed to be a tinge of Ishmaelitism in his composition which prevented his securing that success in worldly matters which otherwise would have been within his grasp. We complete the present obituary list by announcing the death of the Rev. J. Galloway Cowan, vicar of St. John's, Hammersmith, London, who died on the 23rd instant, at the early age of forty-eight. Mr. Cowan was an enthusiastic amateur photographer of many years standing. He had tried almost every dry process published, and had succeeded with most of them, although he gave a decided preference to collodio-albumen. Whenever he could steal away for a short period from parochial duties it was his habit to take with him both his fishing rod and camera, for when the weather was unsuitable for the utilisation of one of these it was usually favourable for the other. Into everything he undertook he entered heart and soul; hence we need scarcely observe that he could take portraits and landscapes in which were combined much manipulative and artistic excellence.

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## PRACTICAL NOTES ON THE FADING OF SILVER PRINTS.

I OBSERVE with pleasure that your leading article in the Journal for December 11th is again attracting the attention of photographers to a matter which is not only of vital importance to themselves, but also to the future of photography; and I hope that the subject of the fading of silver prints will receive such attention from your scientific readers as will result in rendering them more permanent. That silver prints must of necessity fade I for one will not admit, since I, like many more, have by me prints more than twenty years old which are still as bright as when first produced, although toned in that much-abused old hypo. and gold toning and fixing bath, which is generally thought by those who have had no experience with it to give prints which must necessarily fade, and that, too, at a very early date.

The very interesting communication in your issue for January 15th from that veteran photographer, Mr. Horatio Ross, in which he suggests that all old photographers should give their experience in this matter, is, I think, a most excellent idea, which I hope will be carried out. I will here give some of mine on the subject.

In your leader which has reopened this question you spoke of a print in your possession produced by me nearly twenty years ago, and which is still in a good state of preservation, although produced

under circumstances that would now be considered highly heterodox; and I think with you that we may look back on some of our old and discarded processes, and inquire into them again with our advanced experience, with advantage. That prints toned and fixed at the same time in the old bath do not of necessity fade is proved by the fact that the oldest prints on albumenised paper in existence were so produced. It has frequently been said that the old bath was not reliable and could not be trusted, as it was uncertain in its action, and the difficulty of knowing if the picture was toned with gold or sulphur; this, I think, is another way of saying that we did not understand its action. All chemical actions may as well be said to be uncertain when we do not understand them. Although I am not going to advocate a return to that process, I will suggest a reconsideration of the method by which we then worked as compared with the one now generally employed.

One of the chief causes to which the fading of silver prints is attributed is the imperfect removal of the hyposulphite of soda from them; yet many prints have been in existence for years that still contain that substance, although they show no signs of decay. Fixing the prints in diffused light is said to be another cause of fading; yet prints so fixed years ago are still unchanged, while prints that have been thoroughly washed and have been fixed with all care have faded in a few weeks, and even in the washing waters—a circumstance I never remember to have occurred in the olden time. Again: mounted prints have been known to change in a very brief period, whilst unmounted ones produced at the same time remained unchanged. The cause assigned for this is hypo. in the mounting-boards. Spots make their appearance during the production of the prints or in a few days after they are mounted. Many and various have been the causes assigned in the journals for these defects, such as bronze powder on the mounts, the presence of lime, small particles of chemicals (as dust, germs, &c.) floating in the atmosphere and then settling on the prints, thus causing decay. Lately, some of our continental friends have discovered that they may be caused by small particles of tobacco-ash falling on the print while it is wet.

Now all these causes of decay existed in the early days of albumenised paper, and yet I never knew of the prints suffering from them—at least in so short a time as they appear to do now. It is true that they faded and that spots did occasionally make their appearance, but only after the lapse of a considerable time. The knowledge of this fact naturally leads one to inquire if the prints we are now producing, beautiful though they seem, are more delicate in their constitution than those of former production, and thus less able to withstand those trifling causes of decay. If we consider the matter I think we must come to the conclusion that the prints of old were more *robust*, or, in other words, contained more of the reduced metals, and consequently a larger quantity to be destroyed by any of the deleterious agents, than those we are now producing.

Let us contrast the two methods of working now and then. At the present time our negatives are generally made very thin and delicate, so as to get as many prints off in a given time as possible, the shadows being quite transparent and the lights only just sufficiently intense to protect the paper from the action of light whilst the other parts are being coloured. Such negatives print through in a very short time, and the image appears to be only on the surface of the paper. The albumen with which the paper is now prepared is very lightly salted, containing sometimes as small a quantity as three, and rarely more than seven, grains of chloride to the ounce, the object of this light salting being to permit of the use of a weak silver bath on the ground of economy. This is evidently now a desideratum, judging by the advertisements in the journals stating that certain papers give brilliant prints when sensitised on weak baths, and tone more easily than other papers. The paper is floated on this weakly-salted albumen, and then dried as rapidly as possible, the object of this being to keep it on the surface of the paper so as to obtain the highest glaze. The sensitising of paper thus prepared is effected by floating it for two or three minutes on a bath containing from thirty to fifty grains of silver to the ounce of water, to which other nitrates are sometimes added. Such paper tones very readily in any of the baths now employed, requiring very little gold for the purpose, as there is so little silver to be converted. The prints are fixed by immersion in a solution of hyposulphite of soda of the strength of from two and a-half to five ounces to the pint of water, the time allowed being generally from eight to fifteen minutes. As a rule, the prints receive quite sufficient washing to remove the hyposulphite of soda—certainly quite as much and more than was usually given, hot water being frequently employed, which was rarely used in former times.

Now let us look at the old method. And, first, the negative—the old pyro.-developed one, iron not being used for the production of negatives at that time—was a very different thing to the modern one, being very dense and opaque, this quality then being considered one of the essentials of a good negative. Of course, such a negative would take a very long time to print—in some cases nearly as many hours as the modern one does minutes. The paper then in use differed from the present inasmuch as it was prepared with albumen diluted to the extent of one-third to one-half with water; but very soon the water was discarded, and undiluted albumen used instead, so as to obtain a higher surface, the amount of salt, however, remaining the same, namely, from ten to twenty grains of the chloride of sodium or ammonium to the ounce of albumen. In floating the paper on the albumen it was allowed to remain on it a much longer time than at present, so that it penetrated into the paper instead of being only on the surface as now, and I think that this difference in treatment may account for the fact that blisters were then nearly unknown. The paper thus prepared was floated for a period of from three to five minutes on a bath of nitrate of silver of the strength of from 60 to 120 grains to the ounce of water. After the printing—which was carried so much farther than at present that a print which would then be considered the right depth would now be thrown away as worthless on account of over-printing—the print was placed in the toning and fixing bath in most cases just as it was taken from the printing-frame; in others, especially in the latter days of the old bath, it was not immersed until after it had been washed to remove the free nitrate of silver from it. The toning and fixing bath was generally prepared in the following manner:—Twelve ounces of hyposulphite of soda having been dissolved in twelve ounces of water, fifteen grains of chloride of gold were dissolved in two ounces of water, and poured by degrees into it, stirring all the time with a glass rod; then thirty grains of nitrate of silver dissolved in two ounces of water were added in the same manner. This bath, after standing twenty-four hours, and being filtered, was ready for use. The prints were left in it until the colour required was obtained, and they were then considered fixed as well as toned. The time required to tone the prints varied from about twenty minutes to two or three hours, according to the state of the bath, the temperature, &c. They were then washed, but not, as a rule, to the extent that is now adopted. Sometimes, but not generally, they were immersed for a short time in a plain solution of hypo., and also ironed with a hot iron after being washed and dried.

Now let us examine the prints produced under these two different circumstances—first, by touching the whites with a little sulphide of ammonium, when we shall find that the one toned by the present alkaline method will give a decided stain showing the presence of silver, while the other will scarcely show a trace. This has been fully treated upon in your pages by Mr. M. Carey Lea. In my opinion this difference is not so much due to the method of *toning* employed as to the long-continued action of the strong solution of hyposulphite of soda. Next, let us remove the albumen from the two prints, and we shall find the image of the one printed from the thin negative on the weak paper confined almost entirely to the albumen, and appearing very thin and faint in that, and having only the deepest shadows imprinted on the paper, showing that the action of light has been confined almost entirely to the surface of the paper; whereas the prints produced from the intense negative on the strongly-salted and sensitised paper will show the image very strong and vigorous both in the albumen and also on the paper after its removal, penetrating nearly through it, and being almost as vigorous as an under-exposed print on salted paper, clearly showing that the light has penetrated much deeper than in the other case, and also showing that the image is composed of much *more* reduced metal, or colouring matter, than with the weaker paper. This, I think, may account for many of the old prints standing, whilst so many of the new ones succumb to the many trifling deleterious agents they come in contact with, simply because there is a larger bulk of reduced metal to be decomposed which these agents are incompetent to effect.

In conclusion: I may add that I have always found that prints produced from strong and vigorous negatives have proved more permanent than those from weak ones; also, that prints produced on a strongly-salted and silvered paper are more permanent than those printed on a weaker one. I think that these facts should be borne in mind when we are considering the best means of accomplishing that which is the earnest desire of all conscientious photographers, viz., the rendering of silver prints permanent.

E. W. Foxlee.

## A FEW REMARKS ABOUT SILVER PRINTING.

[A communication to the Manchester Photographic Society.]

I promised this paper at our last meeting, not that I had anything new to communicate, but hoping that the little experience I have

had might help those who only print occasionally, and so have time to forget how deep to print and how far to tone and fix.

Though the quality of negative is of the first importance to ensure a good print, it is not of much use discussing what that quality should be when the negative is varnished and we have it to print and make the best prints possible. First, a few words about the paper. The double albumenised I have only used once, and do not intend to have any more. It gives very brilliant prints, warm tones, and is very liable to blistering, cracking, and fading. Ordinary Rives paper prints very brilliantly and gives good tones easily, but is very liable to blister, and is not suited for printing from negatives at all under-exposed (dry-plate workers will know what I mean). I use it for weak, full-of-detail negatives and copies; but for regular printing from negatives with proper and with too much contrast I prefer the thick Saxe paper, which seems to hold the fine, light shades better during toning and fixing. I keep the paper flat and soft between two sheets of millboard in a bedroom which never has a fire in it.

The silver bath I use is forty grains to the ounce, with nothing added; and though ten grains either way does not make much difference I would rather have it weaker than stronger. I keep it clear by stirring it up with China clay every time it has been used; if this be neglected the next paper floated on it will refuse to tone well, and make mealy prints. I have used everything known to clear the bath, but have found nothing so successful and unaccompanied by trouble as the kaolin, followed by settling and filtration, which I effect through a quart wine-bottle with the bottom knocked out, inverted, and the neck plugged with wet gun-cotton, which lasts indefinitely. In floating the paper I have a light at the other side of the dish, and by laying a near corner of the sheet down first I can see through the paper as it is lowered that there are no bubbles, with which I am never troubled.

In summer I float the paper two minutes, draw it slowly from the solution and once over a long quarter-inch glass rod, hang it by a clip for ten or fifteen minutes, and dry off quickly and thoroughly by exposing the back of the paper to a fire. When all the paper is dry it is put in the cellar for five or ten minutes to become damp, without which it would cockle in the frames and print badly.

In winter the paper should be floated longer, as short floating makes brilliant prints and long floating soft ones. A strong silver bath also makes brilliant, easy-to-tone prints, and a weak one softer prints, more inclined to mealiness. The time between floating and drying has the same effect; for a paper dried too quickly is insensitive and prints brilliantly, while one dried spontaneously prints quickly and flat, and the longer the paper is wet the more metallic spots appear. In putting the paper in the frame care should be taken to dust the negative, and place any metal spot in the paper over a deep shadow; the pads and back are put on, but the springs not closed till all the frames are full. I use a pad of thick woollen cloth covered with paper saturated with a thirty-grain solution of soda carbonate, and dried. The weak negatives are printed in a weak light, either by covering with tissue-paper or placing them a long distance from the window. The good negatives are put where the best diffused light can get at them, and I have a few under-exposed ones which need the sun to make good prints, always remembering that by printing quickly a warm tone is easily obtained, and *vice versâ*.

The judgment of depth of printing does not give me much trouble, though I make a good proportion of overdone prints through not being able to stay with the frames. I have seen it recommended to judge of the bronzing of the deep shades, but that merely indicates a strong silver bath. I judge principally by the lights and partly by the general appearance. The print should be about a third darker than it is to remain when finished, but this depends much on light, paper, and chemicals. I like to finish a lot of prints within two days from sensitising—not that the paper discolours, but, if kept long, the metal spots seem to delight in appearing in the skies on one's most perfect pieces of paper; and this is the greatest objection to the otherwise successful methods of keeping sensitive paper white.

Suppose, now, we have a lot of prints to finish. Wash them in two dishes of water, and save it for the silver, and then wash ten or fifteen minutes in running water. I use the final washing trough for this purpose. The toning solution is the acetate bath of one grain of chloride of gold in solution and thirty grains of acetate of soda in ten ounces of distilled water. The gold must not be very acid, and it should be added to the acetate solution at least a day before use; but, if you have forgotten the gold until the prints are ready for toning, then boil the gold in a test tube with a little powdered chalk and a few grains of acetate of soda, and add to the bath. My practice is to add to the above half-a-grain of chloride of gold for every sheet of paper to be toned, and I make the addition when the paper is sensitised.

Now, having the untoned prints in a dish of water alongside the dish of toning solution, have a gas flame at the side of the toning dish farthest from you, and let the light be so shaded that it falls on the prints but not on the eye, or you will soon have partial colour-blindness. The eye and flame should each be about eighteen inches from the centre of the dish, and about two feet from one another. Now immerse the prints one by one, and do not have above six small or two large prints in at once, turn them over and over till they begin to tone, and always lift in such a manner that the reddest end of the print is in the solution the longest time.

The toning is always first visible in the lights and light tones. In the case of landscapes the distance for the sky printed quickly from a thin negative is always of so warm a tone that it looks red in the gold solution. The toning will be about right when the print looks as it should do when finished at the near end of the dish; but if pushed nearer the light or taken into daylight it will look nearly as red as ever. Now put it back in the dish of water and agitate well—not with the fingers only, but with the flat of the hand, as if slapping something. I used to get very good tones by reddening the prints with salt water before toning, but it retarded that operation very much; I now get the same effect by salting after toning, but the tone must be carried a trifle deeper, as in this case they do not tone any more in the hypo., though it blackens the prints a little by dissolving out more or less of the red organic silver compound, according to the strength of hypo. and time of immersion in it. If the salt be not used after toning the prints must be very thoroughly washed before fixing, for which I use three ounces of hyposulphite of soda to a pint of water for every sheet of paper to be fixed. Two or three years since I used only two ounces to the pint, and the prints have not shown the faintest trace of fading, discolouration, or imperfect fixation yet; but I use the stronger solution to save time. The prints are not allowed to rest in the hypo., but are lifted up, drained, and immersed, one after the other, as quickly as possible. The time of immersion varies from ten minutes to not more than twenty. If a print be dark in tone it is removed before those of a warmer tone, for the longer a print is fixed the blacker the tone will be. Fixing by artificial light makes the prints more permanent, and enables one to remove them from the bath before the tone gets too black after fixing.

I wash rapidly in three or four dishes of water, and after that for twelve hours in running water, for which I have a black-varnished, wooden trough about sixteen inches long, eleven wide, and three or four deep. One end is aslant, like the bow of a punt, and the water spreads itself by falling on this, moving the prints in such a manner that they somehow wriggle their tails, swim up to the water supply, and seldom go against the zinc grid at the bottom end of the dish, which is about half-an-inch lower than the inlet end. I can wash two dozen $12 \times 10$ prints at once with this contrivance. When sufficiently washed they are rinsed in a dish of filtered water, drawn over a glass rod, and put between clean calico cloths to dry. I do not believe in blotting-paper, as it cannot be washed.

Prints ought never to be mounted on white boards, as the light and delicate tones are not shown to such advantage as on a tinted mount. If a picture have not sufficient light in itself its absence will be more conspicuous by a surrounding of white, and there is more chance of white card containing injurious chemicals.

The tone of prints for framing and glazing should always be warmer and lighter printed than those to be mounted only. I have framed prints that were nearly red, but when under glass they looked a dark purple. Prints from under-exposed negatives should never have a dark tone, as it makes them look heavy; but a good black tone improves a flat subject wonderfully, and it is always easily got on prints produced in a weak light.

For mounting I use a mixture of fish glue and starch. The gelatine is first swollen, then dissolved by warming, and the starch, mixed with a little water, is added, and the whole boiled well. I consider this superior to glue or starch alone.

I have not practised photography long enough to have any faded prints; the only ones which have discoloured are my very early attempts, or bad ones not worth much care in finishing. I think a carefully-finished print tolerably permanent if it be kept dry and out of the reach of acid or sulphurous fumes. I have found that the iodine method of removing hypo. reduces the prints, and lead salts spoil the tone, so water will have to serve till there is something better found. I used to sponge my prints, and so wash them quickly and thoroughly with very little water; but the labour is too great if you have many prints, though if one or two are wanted quickly nothing is better. The washing water should never be warm—say not above 70° Fahrenheit.

J. Brier, Jun.

## FOREIGN NOTES AND NEWS.

M. Lambert's New Process of Carbon Printing.—Blue in Starch.—New Negative Process by "Alcide," of Saintes.—Prints in Fatty Inks.

We mentioned the other day that M. Lambert—author of the enlarging process to which the name of "*Lambertypie*" has been given in France—has introduced some little novelty in carbon printing, which is said to render the process available in printing portraits, so that professionals may now with comfort and advantage to themselves, and a great gain to the public, give up entirely silver printing. What this little novelty may be must be learnt by licencees on payment of a certain fee; but this much we are able to say concerning it, namely, that M. Mévius, of Rennes—whose name is familiar to our readers as one of the leading professional photographic portraitists in France—has obtained a licence, and is so charmed with the process that he has written in praise of it to the *Moniteur*, and takes to himself the honour of being the first provincial photographer who has acquired a licence. In proof of what the process will do he has enclosed to the editor his card-portrait printed by it; and the editor states, with true French politeness, that nothing more perfect could by possibility be obtained. Now, as we are well aware of the extreme caution M. Mévius adopts in his practice, although he may give a trial to any novelty, we are induced to believe, from his present burst of enthusiasm, that there really is something in the Lambert process of carbon printing to which the name "*chromotypie*" has been given in his advertisements—a term which he considers to be perhaps synonymous with pigment printing. We must add that M. Mévius winds up his letter to the editor of the *Moniteur* by saying that it will be a great satisfaction to him in future to be able to deliver permanent proofs to his sitters. So, in his hands, at least, silver printing has been doomed. This is really important, because it is the practical result at which a first-rate practical man has arrived. Some first-class professionals in Paris are now employing the new process. Those who visit that gay capital may see specimens of it at the establishment of M. Liébert, in the Rue de Londres.

M. Baudoux, of St. Heliers, states that English starch is not so good as French starch for mounting prints, because it contains a blue colouring matter. Here we have another cause of fading! How many more will turn up before the year is out?

The same gentleman states that he finds the yellow spots on prints due entirely to the use of a particular kind of cards for mounting.

A photographer at Saintes, signing himself "Alcide," alludes to a patent which he has taken out under the title of "*photopolytypié*," by which he can produce negatives which require no retouching, and which is even simpler than the common wet collodion process. We are promised further particulars of it in due time. His specimens are said to be good. The author, speaking of the rapidity with which negatives can be produced by his process, says that he can take thirty in the same time that would be required for taking two in the ordinary way. Another curious fact is that a hard negative is impossible by his process. He also asserts that the style of print can be varied according to the nature of the light, and other circumstances, in the printing. The author's intention is to grant licences for using his invention. He concludes by telling us that he lives in a small town, without an assistant, and that he has become entirely rusty through not having visited Paris for a long time. Paris will, no doubt, be delighted to receive him, and will rub off all the rust which he has to bestow, and send him back to his little town with quite a fresh polish.

Some proofs in fatty ink, done by M. J. Leipold, Director of the national printing and engraving establishment, at Lisbon, are spoken of as magnificent successes. One of them represents a poignard, full size, which is made of silver and elaborately chased. The proofs are taken from negatives of singular perfection and suitability for the purpose, by M. Carlos Reloas.

West Riding of Yorkshire Photographic Society.—The next meeting of this Society will be held on Monday next, the 1st February, at the Victoria Hotel, Exchange Station, Bradford, at 7.30 p.m. A paper, on *Warming Studios*, will be read by Mr. Howarth, and a communication from Mr. W. H. Brunton, Whitehaven, on *The Acceleration of Exposures.*

## THE LATE O. G. REJLANDER.

It was last week our sad and painful duty to announce briefly the death of an eminent photographer and painter, Mr. Oscar G. Rejlander, who passed from us in the last stage of a wasting and painful disease, from which he had been suffering for many months. He was in his sixty-second year, and his death took place at his residence in Clapham on the 18th instant. Until within a very short period of his demise he was occupied in the duties of his beloved profession, resting at short intervals, moving from his couch to the camera or easel feebly and slowly, but working almost to the last with all his old enthusiasm, earnestness, and vigour of conception. He was thus engaged when we last saw him in life at his pretty studio in Victoria-street, Westminster, and our future remembrance will most frequently picture him as he then appeared—worn, pale, and thin, with his clothes hanging loosely about him, but earnest and fervent, critically discussing the merits of a high-class painting he was about to copy, and dwelling upon its beauties.

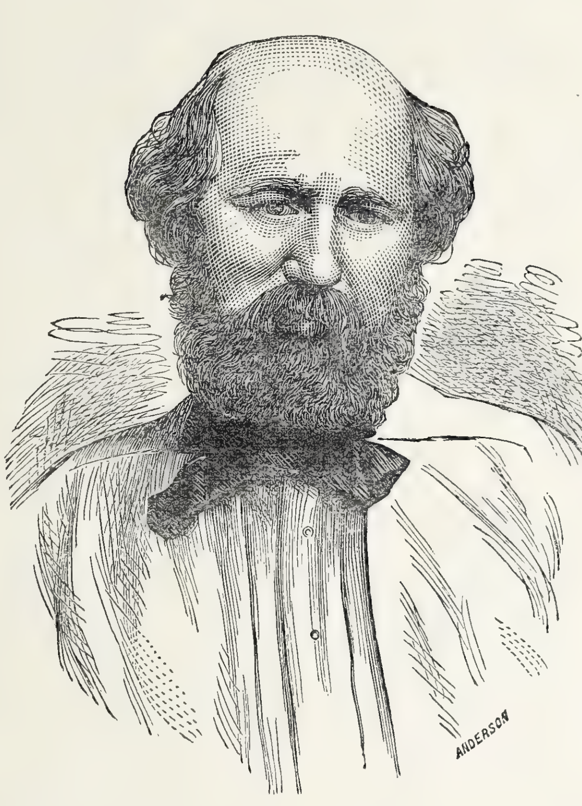
Mr. Rejlander was no ordinary artist. For many years past the originality and beauty of his productions have widened the sphere of our pleasures, elevated our conceptions of photographic art-power, and shown the right way to many who would otherwise never have either sought or discovered it. He was the pioneer who first tried the unknown path and pointed out its goal. His plough first opened the virgin soil in which his successors sow and reap. What a crowd of admirably-conceived and artistically-treated subjects pass before us as we think of all he did! Some full of sly fun and humour; others displaying higher thought and deeper feeling; some sad and pathetic; others merely graceful and elegant; none that did not embody a new idea or give expression to feeling and sentiment of one kind or another. In his portraits we have just that vast variety of character shown in action, pose, or expression which we observe in men and women performing the ordinary functions of their every-day lives, but so seldom see in the glass room or the album.

His camera sketches of street arabs and desolate outcasts of the metropolis have often been engraved for religious publications, to plead in the name of Christianity and poor humanity the cause of the helpless, neglected, or forsaken. There is scarcely a high-class illustrated paper, English or American, in which we have not seen many engravings from Rejlander's photographs—generally acknowledged, but often not. His appreciation of the great old masters of painting was shown in the patient and anxious care with which, while on the continent, *con amore*, he copied many of their greatest works. His critical earnestness and sincerity were shown by the way in which, aided by the camera, he demonstrated undiscovered and unsuspected blunders in some of them, thereby at once convincing and teaching.

He was not, photographically speaking, a skilful manipulator, and he never had the slightest ambition to be one, for he grudged every thought and every effort of his mind which was devoted to mere mechanical difficulties; hence we often detect in some of his finest works defects which the veriest tyro can avoid, but to dwell on which in the presence of so much that is intellectually high and beautiful, as some do, is, to our humble thinking, something very like ingratitude.

Although so many picturesque photographs more or less expressive of artistic aspirations, sympathy, taste, or knowledge have been exhibited of late years, the promise they display is but that of infancy compared with what may be done with matured experience after the adoption of a properly-systematised course of special study and practice. The photographer of to-day serves no apprenticeship to either art or science; when he can "take a picture," however unpicture-like it may be, he begins his professional career and dubs himself "artist." His mind has received no preliminary training, his knowledge grasps nothing beyond the mechanical details of technical execution. It was not so with Rejlander; and by what he did with his earliest advantages let us conceive what may yet be done by those as earnest and thorough who begin with his advantages and our own. Without encouragement, with the most imperfect appliances, with nothing but coarse work girls and non-professional male models, and under other difficulties of the most disheartening nature—with no possibilities demonstrated for his guidance, no examples of success to encourage him—he took up the camera, as he took up his brush or pencil, to embody therewith the creations of a previously-educated mind. He resolved to do what never had been done, and what crowds of able thinkers in art declared loudly never could be done, and he produced as a first result *The Two Ways of Life*, which was exhibited in the Art Treasures' Exhibition at Manchester. It is a picture which, as a picture—fine as it undoubtedly is in its parts—we do not greatly admire; but as an example of difficulties mastered and possibilities demonstrated it was simply

wonderful! The late Prince Consort—himself an art-critic of no mean power—recognised this, and found so much to admire in the photograph, that up to the day of his death it occupied a conspicuous place in one of the rooms he most frequently occupied. Sir Coutts Lindsay, the eminent and accomplished painter, recognised it, and it won for the dear friend we have personally lost a friendship which we know remained warm and true to the mournful hour of his death. Between the prince, the painter, and the photographer there seems to have been at once an intelligent sympathy, and it was from these kindred spirits only that Rejlander derived his first real encouragement and support. The paper he read before the London Photographic Society, in explanation of the process he adopted for printing its parts to make a whole so comparatively perfect, won him scant praise, and that little was awarded not to the boldness and originality of the conception, the loftiness of the attempt, or the demonstration of truths pregnant with the most important applications and glorious promise for photography, but to the meanest and most mechanical of the many difficulties he had more or less successfully overcome.



THE LATE O. G. REJLANDER.

FROM A PHOTOGRAPH TAKEN IN HIS OWN STUDIO.

Rejlander was born in Sweden; his father was an officer in the Swedish army, and died when he was very young. At an early period of life he commenced his studies for the profession in which he became eminent, and we have heard him narrate many anecdotes of his career in art before he was enabled to gratify the desire which haunts all true painters — that of visiting and studying in Rome. At last he reached that famous city, where he supported himself by painting portraits, and had the advantage of pursuing an excellent course of study by copying the great works of famous old masters. It was in Rome that his attention was first attracted to photography, where, also, if we remember rightly, he originally began to use the camera; at first, however, merely for a purpose to which it is now largely applied—that of photographing the folds of any drapery he was painting, which once disarranged cannot readily be recast, as of course it should be, in exactly the same way. He visited Spain, where he copied and, we believe, photographed some of Murillo's masterpieces. Afterwards returning to Rome he there met with a romantic love adventure resulting in his visiting England, which henceforth became the country of his love and his adoption.

In England he first practised as a portrait painter, and it was in connection therewith that he first began to photograph from living models. He was also an accomplished lithographic draughtsman, and practised that branch of art also; but finally he abandoned both and devoted himself almost exclusively to photography. For many years the scene of his labours was Wolverhampton, in Staffordshire. In that smoky and dingy region of furnaces, forges, and factories he produced a large number of his more famous negatives, consisting largely of studies from the nude, the embodiment of graceful little fancies, such as *The Female Head-dresser, Infant Art, Photography Offering a New Brush to the Painter, Old English Oak*, &c., and at length the more ambitious effort to which we have already alluded, *The Two Ways of Life*, which remained his own special favourite, and was always referred to by him with feelings of affectionate regard, although of all his works it was, perhaps, that in which most faults might be discovered, and was certainly least appreciated by the general public. Many saw nothing in it but a wonderful expression of the producer's patient industry and mechanical ingenuity; others, who recognised all the great things it achieved and the greater things it aimed at, wonderingly regretted that the genius of so great an artist should have been pitted against a task far beyond the most clearly-demonstrated boundaries of his art.

Coming to London (we think in 1860) Rejlander set up his studio in the Haymarket, a few months, or weeks perhaps, after we first had the pleasure of seeing his kindly blue eyes and cheerful smile, receiving his warm and hearty shake of the hand, and listening to the quaint originality of his remarks. Here he remained but a little time before removing to Kentish Town. The studio he built there gave us all new ideas on the subject of pictorial light and shade in relation to photography. It was the first of its kind, and the soundness of the scientific and artistic principles on which he constructed it was shown in many a paper and discussion afterwards published in this Journal, and most indisputably by the work produced in it. It was mean in appearance and humble in construction compared with the handsome and much larger studio in which the great artist's last negatives were taken; but we have often heard him compare the two to the depreciation of the latter, and regret, with no little sadness in the tones of his voice, that he was unable to add to that in which he was then working just such a room as he had built at Kentish Town.

It may be worth noting among the triumphs won by Rejlander in the great mission of his art life the change his works mainly wrought in the public knowledge and appreciation of photography. No better illustration of this may be found perhaps than is afforded by consulting past volumes of the *Art Journal*. In the earliest will be found the art power of photography emphatically denied and even ridiculed; in some of the later volumes it will be found fairly acknowledged and enthusiastically admired. To show how this change was wrought, and how fairly we have assigned a cause for it, we quote from the volume of 1868 as follows:—

"If, a few years ago, we had been asked the question—'Has photography produced anything worthy of being called a work of art?' we should have hesitated to give an answer in the affirmative; * * late years, however, have shown that more can be done than we at one time thought possible. * * Of Mr. Rejlander's pictures—for such we may justly call them—we have no hesitation in saying that they are full of beauty and full of mind. A glance at any of the eighty specimens given in his album suffices to convince us that we are in the presence of genius."

In his social qualities Mr. Rejlander had the means of converting most of his acquaintances into admirers, and most of his admirers into loving friends. It was only a question of time. He was an admirable companion, full of good stories vividly conceived, and clothed with a quaintness of thought and expression the very novelty of which was pleasing and attractive. Generous in his every impulse, and full of a childlike simplicity, which gave each impulse the fullest and fairest play. Wherever there was a chance of his words hurting the feelings or wounding the pride of others—as occurred sometimes in the heat of vexed discussions at the societies and elsewhere—no one could have been more cautious or guarded in his utterances than he. In all our many interviews with him—at meetings of literary, artistic, or photographic societies; at his home or elsewhere; in his studio, or amongst the merry, social gatherings of congenial spirits on which he shone so brightly and where he will be so sadly missed, we never, although we enjoyed his entire confidence, heard him utter a single word depreciative of any of our mutual friends or acquaintances. It was painful to him—perceptibly painful—to hear others speak such disparaging words, and we often refrained from doing so in his presence, even when we were sorely tempted to speak out and denounce those who had gratuitously insulted him—often from private motives—or ignorantly abused in print some of his very finest productions. He was tender even of the feelings of his enemies—if, indeed, he had any real enemies.

In the practice of his art, in his advocacy of its claims to a lofty regard and earnest study, in his social and intellectual qualities, as well as in his character as a man, Rejlander was a friend such as we may never see again on this side of the grave.

Lastly—and we now approach a subject which requires delicate handling—our departed fellow-worker was not a rich man. His earlier professional efforts in London—mainly through an error of judgment in respect to locality, partially through his disinclination to work merely for money and to pander to the bad taste of ignorant patrons, combined, perhaps, with an unwise neglect of care in his mechanical and chemical operations*—were not successful; and his after successes, which were undoubtedly great, saddled as they were with very heavy expenses, had barely carried him beyond the pursuit of these early difficulties when the end came. We need only add that beyond the business so intimately and peculiarly bound up with himself and his exceptional genius and ability, and the negatives, which are valuable only in proportion to the business qualifications of their owner, his widow is left dependant upon the assistance of her friends, to whom her melancholy position will not, we trust, appeal in vain.

Amongst the anecdotes told of Rejlander's closing hours, the following struck us as very touching:—He was but half conscious, and very near the end, when his wife, thinking, perhaps, to inspire him with the hopeful views she strove to entertain of the future, said that on the Monday she would take tickets for a seaside visit, as she believed the fresh air would benefit him. He turned his head heavily towards her, eyed her dreamily, and, as if half awake, whispered—"Yes; with Teddy, with Teddy," that being the name of a poor little fellow whose death by drowning he had witnessed not long before at the seaside. Even then the great wave which had been rolling onward through the past month nearer and nearer, day by day and hour by hour, had reared its ghastly head to overwhelm and sweep him away into the great ocean of eternity. Not many hours after Rejlander had gone from us for ever. It was at eight o'clock on the Monday of that proposed visit to the seashore that he died.

Prominent in whatever he undertook Rejlander was for many years associated with the great volunteer movement. A passionate admirer of this country and of its government, he was one of the first to join its ranks, and almost his last audible words were—"I shall die a volunteer; let me be buried as one." Accordingly, on Saturday last, with the consent of Major Leighton, R.A., his mournful comrades of the E or Artists' Company of the 38th Middlesex—with all of whom he was, we are told, a special favourite—followed his remains to their last resting-place in Kensal Green Cemetery, and fired a parting volley over his grave. In this company Rejlander was a corporal; and there was not a member of the corps more earnest in the discharge of his duties—more anxiously zealous for securing the efficiency and soldierly appearance of the entire body. We have drank from the massive silver cup he recently won in competition as a marksman, and we have seen letters from his commanding officers awarding him special thanks for his ability, zeal, and earnestness. The son of a soldier, he had all the military aspirations which made him a good comrade, an able officer, and, in the event of any necessity having arisen, would have converted him into one of the most staunch, eager, and effective of Old England's bravest defenders. We could narrate several anecdotes of the coolness with which he faced serious danger, and the courage with which he could, when called upon, resent an insult or defend himself from outrage.

Amongst the artists present at the cemetery were Sir Coutts Lindsay, Rejlander's two volunteer comrades, and several eminent painters, who were, with the deceased gentleman, members of the Circle Club. Prominent amongst those present whose names are more or less well known in the photographic world were Messrs. Spiller, Pritchard, Blanchard, Taylor, Mayland, Mills, Newman, Simpson, Werge, and Foxlee; and in the remaining groups were many London journalists to whom Mr. Rejlander was known in connection with many pleasant meetings, amongst them being one of the oldest and best known in the metropolis—Mr. E. Draper.

Our portrait, from a large photograph taken in Mr. Rejlander's own studio, is remarkable from its curious resemblance in general effect of pose, costume, and expression to one taken of Garibaldi shortly after his triumphal march through Italy.

* We have seen our poor friend developing a 10 X 8 or 11 X 9 plate, pouring his developer from the mouth of a champagne bottle with apparent carelessness, but really with curious dexterity and skill.

## THE TRANSIT OF VENUS.

In our last number we gave a description of the method employed by Lord Lindsay for securing photographs of the transit of Venus. We are now, thanks to Lieut. Noble's communication to *The Illustrated London News*, able to supply particulars from the Honolulu Station.

The photo-heliograph (he says) is moved by a clock. Its mounting is equatorial, the diameter of its object-glass being four inches, and its focal length about five feet. The object-glass is so constructed as fully to utilise the actinic or photographic rays. Behind the primary focus is placed a strong magnifier, which enlarges the image to a diameter of four inches on the sensitive plate, which is six inches square. The exposure is given by severing a thread which allows a slide, with a slit ranging between one and five-tenths of an inch, and drawn by the tension of a piece of string fastened to a spiral steel spring, to cross the field. The exposure only lasts for about the hundredth part of a second. By this method photographs of the sun can be taken every two minutes, the time being accurately noted. The appearance of the planet on the negative is that of a large spot. At the moments, however, of internal contact, at ingress and egress, there will be substituted for the above a different method, by which a circular plate in a slide revolved by hand, and exposing the same part of the sun's limb at every second for fifty seconds, will begin its revolutions about thirty seconds before the moment of contact is calculated to take place. The exposure is given simultaneously with the beats of a chronometer, and it is hoped that a picture thus taken and corresponding to a definite second of time will show the actual contact, or breaking of contact, of the planet with the limb of the sun.

The "model Venus" is a contrivance whereby the observation of the transit was rehearsed beforehand. A small black sphere to represent the planet is drawn by clockwork across the face of a triangle, the sides of which represent the limb of the sun. Behind this apparatus a mirror is placed; and a bright reflection of sunlight is kept on the moving planet and on the object-glasses of the observing telescopes, which are placed at a distance of 800 feet away. The time of contact of the planet with the sun's limb was to be observed. This observation was to be made by three observers at three telescopes, acting independently of each other, and in strict silence; the times were to be recorded, and afterwards to be compared. The leading aim, therefore, of the previous experiments was to accustom the observers to the class of phenomena with which they would have to deal on the occasion of the actual transit.

The day of the transit was very hot, but quite cloudless. A small guard was landed from H.M.S. Scout, the senior officer's ship here, to prevent people making a noise near the enclosure. Captain Tupman, R.M.A., the chief officer of the service, was at the 6-inch equatorial, and Mr. Nicol at the 4½-inch equatorial—both fitted with double-image micrometers. Mr. Noble was at a detached 3½-inch Greenwich telescope, mounted near the alt azimuth hut; and Lieutenant Ramsden, R.N., worked the photoheliograph, with three non-commissioned officers of the Royal Engineers as assistants. The external contact was observed by Captain Tupman through the spectroscope, and the internal contact by the observers at their respective telescopes. Mr. Ramsden took as many photographs as possible of the sun with Venus on it till it got too low. The internal contact took place at 3h. 35m. 54s. Honolulu mean time. The sun set with the planet on it, and Venus was then quite visible to the naked eye.

The natives took great interest in the event. They stared at the sun through smoked glass, and clambered up trees to have a look at us at work, but were perfectly quiet, and the guard had nothing to do. Our enclosure is about half a mile from the town, close to the beach, on a long plain stretching away to a bold headland, an extinct crater, called "Diamond Head." Professor Forbes was disappointed by a cloud at Hawaii, and missed the contact. Mr. Johnson saw the contact at Kanai, these two being subsidiary stations to Honolulu.

And the *Daily News* reports successful news from other stations.

At length (says our daily contemporary) we have news of really effective results from the English expeditions to view the transit of Venus. The good news from Egypt had been entirely cancelled by bad news from the paired stations for observing egress in New Zealand. The fairly-good news from the Sandwich Isles was only important if the ingress had been observed either at Rodriguez or Kerguelen Land. We now hear from Rodriguez that the whole transit was observed under excellent conditions. Thus at length we have a pair of observations for Delisle's method as applied at government stations; and this is some set-off against the manifold successes of the other nations. Nine Janssen plates were also obtained. What this may mean is not quite clear. Janssen's plan was to take sixty pictures round one plate at intervals of a second, the minute during which the turning lasts being so taken as to include the important moment of internal contact. Either, then, something went wrong with the machinery, or fifty-one of the pictures were in some way spoiled. However, the matter is not of very great importance, seeing that a success with the Janssen instrument would only have been useful for pairing with successful results in the Sandwich Isles, and we know that the Janssen plan totally failed there. Fifty-eight sun-pictures were obtained at Rodriguez. Unfortunately, Professor Newcomb's estimate of the accuracy of the photoheliographic method forbids us to attach any great value to this result. It is probable that the most important of the successes at Rodriguez consists in the observation of the duration of transit. This Halleyan success will combine effectively with the corresponding successes obtained in the northern hemisphere.

The French have excellent news from two of their stations. At Pekin the whole transit was observed, and no less than sixty daguerreotypes were taken. These, we know, are likely to be trustworthy, since the Astronomer-Royal himself admits that photographs on silver are infinitely more exact than photoheliographs. Pekin being one of the most important of the northern Halleyan stations, we have now further assurance of the success of observations of duration in the northern hemisphere. At New Caledonia one hundred good daguerreotypes were secured—a valuable result, though New Caledonia has only a medium position so far as the chord of transit is concerned—in fact, at the time of mid-transit for New Caledonia, the distance of Venus from the sun's centre is almost exactly the same as for the centre of the earth. New Caledonia would have been rather valuable as a Delislean station had egress been observed, but, like the observers at New Zealand, those at New Caledonia had a clear sky till the Sun drew near the horizon, when clouds concealed him; and thus the egress of Venus was missed. This was quite a common experience in the late transit, ingress being missed at Hawaii, where the sun was near setting, and at Mauritius and Bourbon, where the sun had lately risen; while egress was missed at all the New Zealand stations and at New Caledonia, where the sun was drawing near to the horizon, and at all the best (Russian) stations where egress occurred soon after sunrise. The risk of this was pointed out long ago, as one among many reasons for modifying the scheme of operations, which was originally limited to stations of this very kind—that is, stations where the critical phase occurred with a low sun.

The Italians, in the long-neglected Indian region, have met with excellent success. There were five observers near Bengal, viz., Tacchini, Dorna (query Denza?), Lafont, Morso, and Abetti. Tacchini and Abetti observed only the egress; but the others observed both ingress and egress. They placed chief reliance on the spectroscopic method of observing Venus when still outside the solar disc before ingress, and, as she passes off, the sun's disc at egress. A very curious observation was made at egress, the planet being seen apparently in internal contact with the sun as observed with the spectroscope more than two minutes before she was seen in internal contact by the ordinary telescopic method. This corresponds with the fact discovered by Professor Young during the total eclipse of December, 1870 (but inferred from theoretical considerations some time earlier), that the outer part of the visible sun consists of an exceedingly complex gaseous envelope.

## Meetings of Societies.

### MANCHESTER PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting of this Society was held at the Memorial Hall on Thursday evening, the 14th inst.,—Mr. W. T. Mabley, President, in the chair.

After the routine business, Mr. John Brier, jun., read a paper entitled *A Few Remarks about Silver Printing* [see page 52], and exhibited a number of prints in illustration.

Mr. Brothers, F.R.A.S., said that as photography had been employed in the recent transit of Venus he thought the members would be glad to know in what way the photographic methods had been made useful. He then, by means of a large number of diagrams, illustrated the whole subject of the transit, and concluded by explaining the application of photography.

The diagrams were shown by means of the oxyhydrogen light, the lantern being managed by Mr. Coventry, and Mr. Noton produced the oxygen, by means of his apparatus, during the lecture.

The meeting, which was very largely attended, concluded with a vote of thanks to each of the gentlemen who had contributed to the evening's proceedings.

## Correspondence.

### Artificial Lights for Photography.

In an article which I contributed to The British Journal of Photography (No. 750, vol. xxi., page 572), I gave a full description of a light resulting from the combustion of bisulphide of carbon and binoxide of nitrogen, which had been exhibited at a meeting of the French Academy of Sciences by MM. de Lachanal and Mermet, as possessing immense photogenic power, and which might render great service to photography. These gentlemen at the same time laid before the members present some prints which were made by the light at the studio of M. Franck de Villecholle, the well-known photographer. In the hope that this light would be of service to the readers of The British Journal of Photography I began to experiment upon it, and the results surpassed my hopes. Alas! I found that this light could not be produced without danger, and the Editors of this Journal at the same time told their readers to be cautious, drawing their attention to the danger attending its use in an editorial note (vol. xxi., page 576), to which I thought it my duty to reply. From that moment experiments took place regularly in my parlour in the presence of practical men, among whom I may name M. Bardy, M. Adam-Salomon, and M. Ch. Petit. I concluded an article (vol. xxi., page 595) with these words:—"I hope ere long to submit to your readers an apparatus which offers no danger. M. Bardy, a celebrated French chemist, has offered his co-operation for a series of experiments having that object in view." I have the pleasure to fulfil my promise, and can say that our labours have not been lost. *Labor omnia vincit.* I send for the appreciation of the readers of The British Journal of Photography the following communication, which is to be laid to-day before the French Academy of Sciences:—

*Communication on Artificial Lights Serviceable in Photography.* By MM. A. Riche and Ch. Bardy.

MM. de Lachanal and Mermet published for the archives of the Académie des Sciences, vol. lxxix., page 1,078, a very interesting communication, in which they established that a flame resulting from the combustion of bisulphide of carbon by the means of binoxide of nitrogen gas could be advantageously employed to obtain photographic proofs.

These gentlemen described an apparatus by which this light can be produced.* This apparatus consists essentially of a bottle containing bisulphide of carbon, through which a current of binoxide of nitrogen gas is passed. A glass tube is filled with iron turnings, at the extremity of which the mixture is ignited. By means of this apparatus can be obtained, in a regular manner, a soft light possessing considerable photogenic activity, such as had previously been obtained only for a few minutes at a time, and then with disagreeable interruptions.

This question possesses great interest, because enlargements of photographic proofs are frequently made by means of artificial light—lime light, magnesium, &c.—and it is only by such means that nocturnal scenes and obscure positions can be photographed. Indeed, many countries are less favoured by the sun than we are, among which we can name England, where the light is often, in winter, too feeble to take photographic pictures; therefore, it is easy to understand that the introduction of such a light would be immediately communicated to numerous journals on the other side of the channel. Some have criticised the light, and others have predisposed their readers against its employment, warning them of accidents that might be occasioned, &c. M. Peligot himself, whose ability in these matters is so well known, not only warned the members of the Photographic Society of France as to the danger of breathing the vapours caused by the combustion of the sulphide of carbon and binoxide of nitrogen, but also drew their attention to the susceptibility of those gases to explode under certain conditions as yet undefined.

These considerations impressed upon our minds the necessity of examining that subject more thoroughly, and at the same time it gave us the idea to seek the means of guarding against the danger either by modifying the manner of operating or by suppressing the employment of the sulphide of carbon.

We now determined to compare the different lights with each other; that is to say, those lights which, by their brilliancy or by the nature of the light they give, are susceptible of acting on substances the chemical action of light on which is well known. We took for our starting-point the fact that the considerable photogenic power of the flame of binoxide of nitrogen and sulphide of carbon is owing in the greater part not to the combustion of the carbon, which would give a yellowish-white light, but more particularly to the sulphur, the flame of which is of a very pure blue.

*First Experiment.*—Some sulphur was melted in a small crucible, and as soon as it began to burn a jet of oxygen was thrown, as vertically as possible, into the centre. The glass tube through which the oxygen was conducted to be burnt was slightly curved, and was about the ordinary size of gas tubes (seven-sixteenths of an inch in diameter). A beautiful blue flame was immediately produced, with which a collodio-bromide plate was rapidly impressed.

The oxygen can be replaced in the following manner:—Fill the crucible with nitrate of potassium; put under it a Bunsen burner, and when it begins to decompose throw small pieces of sulphur upon its surface. A very brilliant white light is produced, but its photogenic power is less than the former.

*Second Experiment.*—In this experiment bisulphide of carbon was employed instead of sulphur; that is to say, some bisulphide of carbon was poured into the crucible, and, after setting fire to it, a jet of oxygen was thrown on it as in the preceding experiment. The bisulphide of carbon entered into combustion† without projecting any of the matter out of the crucible. The flame is analogous to the preceding one.

It is easy to perceive that no explosion is to be feared, because the two bodies reacting on each other are no longer enclosed together in an apparatus, and the combustion takes place in an open vessel.

*Third Experiment.*—In this experiment the oxygen was replaced by binoxide of nitrogen gas in the presence of bisulphide of carbon. The operation was conducted, as in the preceding experiment, with the gas under the same pressure, and the same tube and crucible were employed. The flame had the same appearance; but, by examining the table which contains the comparative results, it will be seen that the

* See form of apparatus, page 572, and modification of the same, by Professor Stebbing, page 596, of our last volume.

† Takes a spheroidal form.

flame produced by the action of oxygen on the bisulphide of carbon is more active than that caused by the action of binoxide of nitrogen gas on the same product.

The immense advantage that the substitution of oxygen for the binoxide of nitrogen gas offers can be easily understood:—1. It is more economical. 2. It does not emit unhealthy vapours. 3. It is easily preserved for use, for any length of time, in india-rubber bags; whereas the binoxide of nitrogen gas attacks the holder with energy. It must therefore be made at the moment the experiment takes place—an operation entailing the use of acids at once dangerous and difficult in manipulation.

*Fourth Experiment.*—We proposed for this experiment to compare the flame obtained in the first and second experiment (which was without any danger) with a light produced by oxygen or by binoxide of nitrogen gas. This time, however, it was made to pass through a closed vessel containing pumice stone impregnated with bisulphide of carbon. The mixture was, at its exit from the bottle containing the bisulphide of carbon, made to pass through a long glass tube containing iron turnings before it entered the metallic burner, which was also filled with the same shavings. (See apparatus, page 572 of last volume.)

Great care was taken to wind round the bottle and the tube some old dusters, and to cover the whole apparatus with some old carpets. This precaution was not unnecessary when oxygen was used in place of binoxide of nitrogen gas; for the moment it was lighted the flame was forced back through the tube, and the bottle was blown into a thousand pieces, causing the conflagration of the bisulphide of carbon, dusters, &c.

The same experiment succeeded when binoxide of nitrogen gas was employed instead of oxygen, as proposed by MM. de Lachanal and Mermet. The plate was rapidly impressed, but not so quickly as in the first experiment, where sulphur was burnt in an open vessel in oxygen. It must here be noted that the last two experiments cannot be compared with the first three, as these last can be with each other, for the form of the flame is different in the two cases, and if the pressure of the gas was the same in the gasometer its exit was retarded by the iron turnings and the pumice stone with which the apparatus was garnished.

*Fifth Experiment*—1. We compared the flame of sulphur and that of bisulphide of carbon with oxyhydrogen gas obtained by carburetting coal gas with light petro eum.

2. The lime light was then tried.

3. Magnesium was experimented upon.

4. Zinc was then melted in a crucible, and a jet of oxygen thrown upon it when in a molten state.

The results of the preceding experiments are given in the table subsequent to this paragraph.

In order to appreciate the photogenic and chemical power of the above-mentioned lights, we exposed to their action and in an identical manner some dry plates prepared by Professor Stebbing. A large plate was prepared, and afterwards it was cut into pieces three-quarters of an inch broad by three and a-half inches long; upon these small plates all our experiments were made. After a great number of isolated experiments we began those of a definitive character, which were all done the same evening.

The sensitised plate was fixed at a distance of twenty inches from the source of light. The exposure given was sixty seconds; this was measured by a chronometer. The dry plate, at the moment of exposure, was placed in a kind of box (two inches wide by four inches long) having a glass lid divided into ten parts. From the second division to the tenth a piece of waxed paper was pasted; another piece of waxed paper was laid over it, only this time beginning from the third divisiou, and so on, until at last nine pieces of waxed paper were found to be superposed at No. 10. A piece of thin horn, on which the numbers are printed in black, covers this in such a manner that at No. 1 the light can easily penetrate to the dry plate, whereas at No. 10 it is obliged to go through ten layers of waxed paper. In this manner a kind of screen is formed, of which the opacity is proportional to the number of layers superposed, and which is indicated by the number found on the dry plate after development. If, for example, in an experiment Nos. 1 and 2 are only visible on the dry plate, and in another experiment Nos. 1, 2, 3, 4, and 5 are to be seen, it must be concluded that the photogenic power of the second is, in comparison with the first, as five is to two.

All the plates impressed by the different kinds of lights on which we experimented were developed at the same time in a tray by a solution of pyrogallic acid and a trace of nitrate of silver. Each experiment was made twice, and the following table gives the results obtained:—

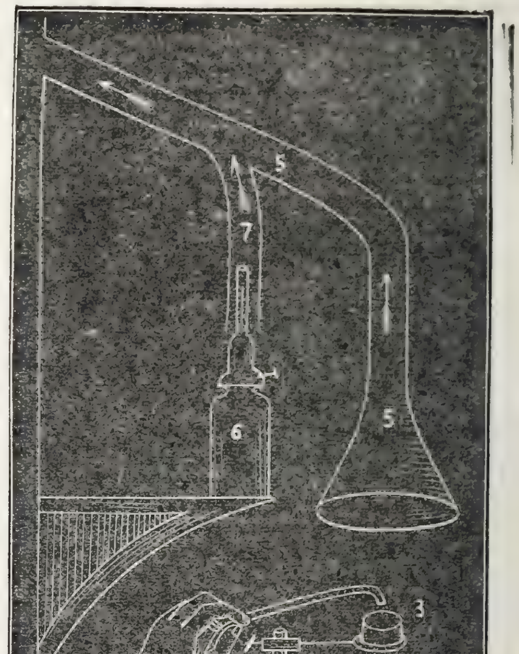
| Kind of light employed. | Numbers visible on the dry plate after development. 1st experiment. | 2nd experiment. |
|---|---|---|
| Oxyhydrogen light | 1 | 1 |
| Lime light | 3 | 3 |
| Zinc, burning in oxygen* | — | 4 |
| Magnesium | 5 | 5 |
| Jet of $Az\,O^2$ in $C\,S^2$, enclosed in bottle | 6 | 6 |
| Jet of $Az\,O^2$ on $C\,S^2$, burnt in crucible | 6 | 7 |
| Jet of O on $C\,S^2$, burnt in crucible | 7 | 7 |
| Jet of O on S, burnt in crucible | 8 | 8 |

The results show that it is the flame obtained by the combustion of sulphur in oxygen which acts most powerfully on silver salts, and we do not hesitate to recommend its trial to photographers. There is no danger whatever in its employment. It is not expensive, requiring only a little sulphur, a bag of oxygen (which gas can at the present day be easily obtained), and an earthen crucible.

It is easy to enlarge the surface of the light by replacing the crucible with an oval one of any required length, and, instead of having only one jet of oxygen, several burners could be joined on to the tube which delivers that gas.

The present process suffers through an inconvenience common to all in which bisulphide of carbon is employed in the combustion—that is, the suffocating smell of the vapours. This inconvenience is not noticed in a laboratory where there is always a very large chimney to carry off vapours, &c.; but when this light is to be employed in a small room it is necessary to put above the flame a kind of funnel connected with the flue by a small tube, through which a current of air is made to circulate by heating the air either by a gas burner or a petroleum oil lamp. It would be better to conduct the combustion in a glass cage in communication with a chimney.

I have followed all these experiments with great attention, and cannot too strongly recommend the trial of the sulphur-oxygen light. At the present time, when education is so rife and lectures are so common, every photographer has the means of easily obtaining a bag of oxygen, and would do well to do so; for I believe that this artificial light is capable of rendering great service, especially in the short, dreary, foggy days of winter—not only in making reproductions, but as an auxiliary to the great source of light in taking artistic portraits. With that idea, and in the hope of rendering some service to the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY, I forward a sketch of the apparatus employed, which can naturally be modified according to requirements.




No. 1, a glass tube connecting the gas bag with burner. No. 2, an iron stand to hold the small crucible. No. 3, a crucible. No. 4, a small alcohol lamp to ignite the sulphur. No. 5, a funnel to receive the product of combination. No. 6, a petroleum lamp employed to establish a current of air in the chimney. No. 7, a shaft connected with the chimney, in which the current of air is formed by means of gas or a lamp.

It is not necessary to employ the oxygen under too much pressure, for with too much of that gas the flame is white instead of blue, and therefore less photogenic. E. STEBBING, *Prof.*

3, *Place Bréda, January* 25, 1875.

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## KENNETT'S PELLICLE.

*To the* EDITORS.

GENTLEMEN,—Mr. P. Le Neve Foster, in last week's issue of THE BRITISH JOURNAL OF PHOTOGRAPHY, has gently, but very firmly, taken

* This experiment did not succeed, because the molten zinc formed now and then a crust on its surface and extinguished the light.

me to task for my observations regarding Mr. Kennett's patent, in my paper read before the Edinburgh Photographic Society, and published in the Journal of the preceding week. Anything from the pen of such a generally-esteemed correspondent and experienced photographer carries with it a weight and importance far above that of ordinary letter-writers, and demands a reply both as a matter of courtesy to him and of defence to myself.

First of all, then, let me assure him that I do not "repudiate patent law entirely," but believe it to be a most excellent and necessary thing for the promotion and advancement of discovery and invention; and I think that a man who has devoted his time and talent, and, probably, his money also, to the completion of an important invention is entitled to the best reward that the nation can secure to him. Photographic patents, however, are in a different category, and to them, with a few exceptions, I take most decided objection.

Photography, as it exists at the present day, has been the work of many minds, each contributing its little to the great whole. Every worker is indebted for nearly all that he knows to those who have preceded him, and I hold that he can only honourably discharge that debt by contributing, for the general good, full information on any and every little dodge or discovery he may make. To the honour of photographers generally be it spoken, this has to a very large extent been done, and hence the rapid advancement the art has made.

Even in photography, however, in the case of any really valuable discovery that was new in principle and had not been led up to by the work of others, I should not object to a patent; such, for example, as the Woodbury process. This, I think, was fairly entitled to protection, and the inventor deserved to reap a good reward. Those, however, who object to patents altogether have in this case an instance of a thing being really better without the aid of the patent law, as, if I am correctly informed, the company at present working it is doing far more for itself and for the advancement of the art since the patent was allowed to lapse than was ever done with it before.

Mr. Kennett's patent, however, is a very different matter. It was applied for on the 20th November, 1873, and his specification describes the making, washing, and drying of the gelatino-bromide emulsion. Now, if nothing of the kind had been published before, he might have fairly considered that the process was sufficiently novel and valuable to be worth patenting. But in September, 1871, and in August, 1873, Dr. R. L. Maddox published a method of making such an emulsion; and on November 14, 1873, Mr. J. Johnston not only published a method of making, but also of washing out, the soluble salts in as nearly as possible the same words used by Mr. Kennett six days later in his specification. It will thus be seen that the only thing that Mr. Kennett can possibly claim is the idea of drying the washed shreds of emulsion; but surely that cannot be of any use to him. If I prepare and wash an emulsion as directed by Mr. Johnston it is obvious that Mr. Kennett cannot force me to dissolve it in water until it pleases me so to do; and if I leave it in my laboratory he cannot, even by the aid of the patent law, prevent the atmosphere from desiccating it; and if I am at liberty to do these things, surely I am entitled to recommend your readers to do the same if they feel so inclined.

In such recommendation, however, I am, by implication at least, charged by Mr. Foster, on his authority as an "old legal practitioner," with furnishing an example of the saying, that "fools rush in where angels fear to tread." This, of course, he does in much gentler language; but I assure him that the opinion, although perhaps not of much value, is not that of a "non-legal man," but of one who has been more or less "a limb of the law" for a quarter of a century. Mr. Foster, as an old legal practitioner, must know well that, in certain aspects at least, patent law is about the simplest branch that can be taken up by a practitioner. The thing protected must be new, it must be fully described, and nothing must be claimed that was previously known. Now Mr. Kennett claims the making of the emulsion *solid* or dry, and six days before his specification was sent to the office Mr. Johnston had published his recommendation to cut it into *slices*.

Although, as I said in my paper, I was not sorry to hear that Mr. Kennett had lost money by his ill-advised patent, I am very glad to see that he has commenced the commercial preparation of dry plates, and hope he will find the manufacture a great success—a hope which, if his plates be as good as some I recently made with a sample of his pellicle, will, I have not the slightest doubt, during the coming season be greatly valued.—I am, yours, &c., JOHN NICOL, Ph.D.

*Edinburgh, January* 25, 1875.

## A PERSONAL EXPLANATION.

*To the* EDITORS.

GENTLEMEN,—I venture to ask a small amount of space in your Journal in consequence of the very great number of letters I have received since the issue of the almanacs, and which are all on the subject of the last three or four years' work in collodio-bromide. Many ask that I should at once publish all the results of my experience, and many go back to the old discussions that took place in 1871.

It will be remembered that in June of that year I read a paper on collodio-bromide before the London Photographic Society. I proposed a very great difference in the manner of making an emulsion from what any previous writer had done, and I showed on what point previous workers had been in error. No sooner had my paper appeared than I was instantly attacked, and I was told I was all wrong. Knowing I was right, and feeling the importance of the modification I had proposed, I resolved to submit plates prepared in the manner I proposed to the crucial test of public opinion.

How far I succeeded in proving my case may be judged from the fact that all who really understand emulsion work—the Rev. Canon Beechey, Mr. W. J. Stillman, Mr. P. Mawdsley, Mr. G. Dawson, Mr. H. Cooper, and others—agree with me now; and he would be a bold man who would now propose to make an emulsion with ten grains of silver only to the ounce, or who would attempt to uphold the doctrine laid down by Mr. M. Carey Lea, previous to the reading of my paper in 1871, that any excess of over ten grains was "not only useless but injurious to the emulsion."

Having, then, as I believe, clearly proved my case, I drop commercial photography as far as having any pecuniary interest in it goes, and can answer all the letters by saying that, at any time you have any point that my experience may assist to elucidate, I shall be most happy to contribute my mite.

I cannot conclude without thanking the numerous professional and amateur photographers who have helped me with sympathy and advice. I believe that in the ranks of the profession, as well as among amateurs, I have made not a few friends; and if one or two patentees, and one or two persons whose trade instincts I have offended, have constituted themselves my enemies, and dislike my having written and published all I knew *pro bono publico*, they are, happily, in a very small and powerless minority.—I am, yours, &c., H. STUART WORTLEY.

*January* 27, 1875.

## NITRATE BATH.

*To the* EDITORS.

GENTLEMEN,—Having been in the habit of using, with good results, nitrate of baryta for doctoring *old* baths, I have just made a *new* bath, iodised, &c., as usual, but with the addition of about ten grains of the baryta salt to the ounce of solution. I find it works perfectly, but have not yet had time to test it thoroughly.

I fully expect that in hot weather the advantages will be great, could anyone only find out (and publish) an easy method of removing the alcohol and ether. Then we should hear no more of disordered baths.

I have never heard of the above method of making a *new* bath, so claim it as my own.—I am, yours, &c., O. C. SMITH.

*Stroud, January* 25, 1875.

PHOTOGRAPHY IN COURT: CUSSONS *v.* FERRANTI.—This was an action brought before the Judge of the Liverpool County Court, on Tuesday last, the 26th inst., by Mr. Cussons, of Southport, against Mr. C. Ferranti, photographer, Bold-street, Liverpool, to recover the sum of £20 due for commission upon the sale of a branch business of defendant's through the agency of the plaintiff. It appeared from the evidence that the defendant had instructed the plaintiff in July last to effect a sale of the business in question as quickly as possible, the price for purchase and terms of commission being arranged between them. The plaintiff introduced a gentleman, and effected a transfer of the business on the 1st of August for a sum of money agreed upon by the defendant, but which was somewhat smaller in amount than the sum originally asked. After the transfer had been completed the plaintiff applied to the defendant for an amount of commission *pro rata* upon the amount paid by his client for the purchase. This claim was disputed by the defendant on the ground that the business had not realised the amount first named, and therefore no claim for commission could be entertained; and, further, that the defendant had himself completed the final negotiations with the purchaser, although he had been first introduced by the plaintiff. After hearing the evidence on both sides his Honour immediately gave a verdict for the plaintiff for the full amount claimed, with costs, to be paid forthwith.

THE LATE MR. O. G. REJLANDER AND MR. THOMAS CONSTABLE.—We note in a Scotch contemporary a very interesting letter from the famous Edinburgh publisher, Mr. Thomas Constable. It is dated January 21, three days after that of Mr. Rejlander's demise. Mr. Constable says:—"Among your obituary announcements of to-day I find the death of Oscar G. Rejlander, artist and photographer, whose talents, had they been exclusively devoted to the former calling, must have secured for him a distinguished place in the ranks of that high profession, and who, by many of those competent from experience and capacity to form a judgment, was considered the most artistic photographer that has yet appeared in Britain. It is perhaps not generally known that Mrs. Cameron, whose photographs are so much admired, was a pupil of Mr. Rejlander, and her pictures certainly remind one of his style and manner. When I asked him to name his nationality, he replied in his own quaint fashion—'I used to call myself a Swede, but after thirty-seven years in England I think I may say I am an Englishman.' My acquaintance with Mr. Rejlander arose eight years ago, from his having mistaken for an immediate and unconditional invitation a suggestion which had been made by me to a common friend, that he might with great advantage pay a pro-

fessional visit to Edinburgh. Not many mornings afterwards a carriage stopped before my door, laden with boxes, cameras, and the long-legged appliances needed in the prosecution of photography; and though at first rather startled by the unexpected arrival, we liked the frank and genial manner and appearance of our guest, and I felt it my duty to do all in my power to prevent his utter disappointment in the object of his journey. A shed was at once erected in the garden behind our house, one of our maid-servants willingly entered on duty as his assistant, and intimation was made without delay to those of our friends most likely to patronise the undertaking that an opportunity was afforded them of securing photographic portraits of the highest class. Many friends availed themselves of the occasion, and Mr. Rejlander's mistake proved a fortunate one, not only for him, who returned to London some weeks later, after a profitable holiday, but also for us, who rejoiced to have made the acquaintance and acquired the friendship of one whom I regard as perhaps the most perfect specimen I have known of the entirely natural man. The death of Mr. Rejlander was caused by acute internal disease, and his pecuniary circumstances during the latter months of his life were sadly straitened; but I have reason to know that his characteristic manly courage never forsook him, nor his faith in the Almighty Father of us all. He was pleased to consider himself indebted to me for some small acts of kindness, and almost, if not quite, the latest effort of his pencil was an admirable life-size crayon-portrait, of which he requested my acceptance. But let me now come, as is not unusual in the latest sentence of a letter, to my chief object in troubling you with the present one—namely, to inform your readers that in the premises of Mr. Elliot, No. 17, Princes'-street, there is at present a very striking portrait by Rejlander of the late Prince Consort, which is for sale for the benefit of his widow. It is hoped that ere long there may be given to the public a work entitled *My Dog Donny*, on which Rejlander had occasionally been employed with graphic pen and pencil, in illustration of the life of an animal whose encroachments in the faculty of reason were certainly unsurpassed."

## EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at the small cost of one shilling in our advertising pages. This column is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

A Macintosh's india-rubber life-belt, large size, 40 × 8 inches (may be folded up and put in the pocket), will be exchanged for anything useful in photography.—Address, Maurice O'Conor, Cahirdaniel, Cahirciveen, Co. Kerry.

I will exchange a box of mathematical instruments, by Stanley, London, cost £2 15s., quite new, and two cameo presses, cost £2 10s., for a Grubb's aplanatic lens, for 11 × 9 or 12 × 10.—Address, P. H. D. B., Watling Works, Stoney Stratford.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

J. M. Turnbull.—Received. In our next.

W. F. B.—The invariable rule is to develope for the deep shadows.

Geo. Willis.—We shall be glad to see you when you visit London.

Litmus.—The colouring matter enclosed is aurine. It is soluble in alcohol.

M. Josephs.—We decline answering questions put for the purpose of deciding bets.

O. P. Q.—1. Yes.—2. It is an imposition.—3. If the person call again hand him over to the police.

Wm. Ferguson.—Received. You will ascertain our opinion from the next number of this Journal.

G. Wallace.—Registration will now be of no use, the pictures having been so extensively published.

Midlander.—The plan for a studio seems very complete. We have shown it an architect, who says that it will do very well.

F. Hill.—The prints have either been fixed in too weak a bath or have been allowed to adhere together when in it; hence the yellow stains.

E. G.—Thanks for enclosure, which we have perused. We regret that we are still unable to give any information beyond what you already possess.

"Mark Oute."—We have received from our witty correspondent the first of a series of articles on *Our Club*, which we hope to commence in an early number.

A. Richardson.—The so-called "steel portraits" are nothing more than collodion positives taken upon black japanned iron plates, usually known as "ferrotypes."

G. Drummond.—The simplest way to proceed is to dissolve gelatine in glacial acetic acid, diluted with a certain proportion of water, and add this to the iron developer.

J. W. B.—By placing a small opaque disc, or a vertical bar, in front of the stop in your wide-angle lens the desired equality of illumination of the picture will be obtained.

Saltaire.—We are unable to offer any opinion respecting the merits of the lens about which you inquire, not having seen one. In fact we are not aware of any having yet reached this country.

Meniscus.—1. If you make the radius of the anterior surface of the flint 7·5 inch instead of 7·6 inch the correction will be better.—2. We cannot reopen the discussion on the subject of patents in lenses.

J. B. B.—We hope to be shortly in a position to institute the comparison you have sought; but we shall not be able to adopt your suggestion as to publishing the result in the Journal. Write again in a fortnight.

A. W. B.—1. Our experience with the intensifier named does not extend beyond the experimental stage.—2. Let the stops be as close to the front lens as possible.—3. An excess of nitric acid will cause the fading of which you complain.

William V. Tyzack.—Our correspondent sends us a vignetted card with a "filigree scroll border." The effect is somewhat striking, but we fear that it will require a specially-educated taste to appreciate it. The design, we are informed, is copyright.

R. H.—There *may* be a reward of ten thousand pounds offered for the discovery of a practical method by which photographs may be taken in natural colours, but we certainly have never heard of it. Our opinion is that some wag has been hoaxing you; still you should not discontinue your experiments.

R. Bridgart.—Try the effect of separating the lenses of which the back combination is composed. This may produce as much flattening of the field as will be required. But if the definition be imperfect all over the field, we cannot suggest a remedy unless we are afforded the opportunity of examining the lenses.

J. P. P.—If you can prove that you purchased the business under a misrepresentation of facts, then, we imagine, you have your remedy at law. We fear you will have to meet the bills as they become due—the first one certainly—otherwise proceedings will be taken against you. Lose no time in consulting a respectable solicitor. The advice you have received from your friend should *not* be followed.

J. L. S.—We answer your seven queries by briefly informing you that the sensitive gelatino-pellicle is dissolved in cold water and poured into a flat dish, the paper to be coated being floated upon it for a few seconds. When dry it must be exposed in the camera between two plates of glass. For information relative to the sale of the pellicle and instructions for development we refer you to our Almanac, in the pages of which they are to be found.

Scotus.—The usual method of bleaching engravings is as follows:—Wet with pure clean water; plunge them into dilute solution of chloride of lime; pass them through water slightly acidified with hydrochloric acid, and then through pure water until every trace of acid is removed. It is desirable that after this treatment the prints should be immersed in an exceedingly weak solution of hyposulphite of soda followed by washing. Great care and dexterity are required in handling the engraving, especially if it be of large dimensions. The remainder of your letter will appear next week.

Received.—Mr. Dallas's remarks on a paper on the Dallastype and Pretsch's process, read before the Vienna Photographic Society. We hope to find room for it in our next.

In Type.—"Our Editorial Table;" continuation of Mr. G. W. Webster's series of articles *On the Use of Photographic and Chemical Apparatus;* article *On Change of the Sun's Position at Different Seasons of the Year;* reply of Mr. Sutton to Mr. Lampray's letter on *Sutton's Patent Albumenised Paper*, &c., &c.

☞ **Editorial Communications should be addressed to "THE EDITORS"—Advertisements and Business Letters to "THE PUBLISHER"—at the Offices, 2, York street, Covent Garden, London, W.C.**

## LONDON GAZETTE, *Friday, January* 22, 1875.

Partnership Dissolved.

West London Photographic Company, Norfolk Terrace, Westbourne Grove.

## METEOROLOGICAL REPORT,

*For the Week ending January* 27, 1875.

Observations taken at 406, Strand, by J. H. Steward, Optician.

These Observations are Taken at 8.30 a.m.

| Dec. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 21 | 29·42 | WNW | 41 | 43 | 46 | 42 | Cloudy |
| 22 | 29·85 | W | — | 34 | 43 | 33 | Cloudy |
| 23 | 29·68 | SW | 37 | 38 | 54 | 33 | Raining |
| 25 | 29·20 | W | 41 | 42 | 47 | 42 | Raining |
| 26 | 30·08 | N | 39 | 40 | 46 | 39 | Dull |
| 27 | 30·24 | SW | 45 | 46 | 50 | 40 | Dull |

CONTENTS.

# THE BRITISH
# JOURNAL OF PHOTOGRAPHY.

No. 770. Vol. XXII.—FEBRUARY 5, 1875.

## LAMPS FOR THE MAGIC LANTERN.

Artificial lighting is one of those subjects which, so far as we can see, never grow stale; and among photographers the lighting of the magic lantern is growing in interest. There appears to be a very general desire to obtain an effective substitute for the lime light, and very numerous indeed are the letters we receive asking for information concerning such a substitute. Having bestowed much time during the past fortnight in testing, more or less crucially, several of the best lantern lamps to be met with in commerce, we purpose here to give, in as summarised a manner as possible, the results of these trials.

First of all, we observe that a good substitute for the lime light is still a desideratum. The nearest approach to it that we have obtained is by means of a modified Larkin's lamp, in which a small stream of pulverised magnesium mixed with ordinary sand trickles through the flame of a spirit lamp, producing a luminous flame the intensity of which is kept under control by the simple act of turning a stopcock which regulates the outflow of the powder. The way we burned the powder was as follows:—Near the posterior focus of the condenser was a metallic plate of large dimensions in which was perforated a circular hole rather over the size of a sixpence, and quite in the axis of the condenser. The ignition of the magnesium powder was arranged to take place on the side of the plate opposite to that on which the condenser was situated, and it was effected in such a mode as to present to the condenser a circular spot of intense illumination. Hence there was no wavering or flickering of the flame—which latter, with other evils of an equally serious character, ensued when the diaphragm plate was not in use. One of the functions of this plate was to cut away all injurious light from gaining access to the condenser and hence to the picture undergoing illumination. Another function will be noticed when, on some future occasion, we submit working directions for constructing this lamp, which we believe will be found to commend itself as a simple and good source of illumination to be used in the production of photographic enlargements, and all the more convenient inasmuch as there is no smoke or fumes to escape into the apartment nor is there any deposit upon the lenses.

The Argand lamp has long been a great favourite with lantern exhibitors. In the course of our recent trials we used two of the best that we could obtain, one of them being the usual well-known fountain lamp for sperm oil; the other a Silber lamp for paraffine oil. In principle both lamps are alike, but they differ somewhat in details. The sperm oil held camphor in solution, the mode in which it was added being to make a saturated solution in methylated alcohol rendered slightly warm, and then pouring this into the oil, which is also made previously slightly warm. This is a far better method of procedure than that adopted by many, viz., pulverising the camphor and adding it direct to the oil, which must then be placed for a considerable time on a hob, so as to keep it hot and thus promote solution. By the alcoholic method the requisite addition is made without any delay. This camphoretting of the oil places it in the most favourable position for yielding a white and intense flame. The Silber flame proved rather the better of the two; but whether this arose from any superiority in the construction of the lamp or in the oil used we have not yet determined. The Silber burner, we may state, was screwed into a flat and shallow reservoir, so as to tax to as small an extent as possible the capillary powers of the wick. In the fountain lamp the oil is, of course, retained at a high level.

There were three lamps of the flat-wick description—the sciopticon, Turnbull's triple-wick lamp, and Hinks's duplex lamp. There is a certain degree of similarity in the construction of all the lamps here named, but, as we shall show, they are altogether different in their mode of application. The sciopticon has two flat wicks placed parallel, and a little distance apart. By means of a strong current of air the flames from these two wicks are driven very closely together, and, when looked at endwise, the flame presents the appearance of an intensely-luminous column with a dark vertical strip in the centre, caused by the air passing between, and thus separating the two flames. When Mr. E. L. Wilson, of Philadelphia, visited this country nearly twelve months ago, he, with Mr. Woodbury and ourselves, devoted an evening to trying various effects with the sciopticon. We then suggested, as a probable improvement, the placing the light at such a slight angle with respect to the axes of the lenses as would ensure freedom from a vertical strip of less luminousness sometimes visible on the screen. This, Mr. Wilson said, had been tested by Mr. Marcy, the inventor of the lamp, who, after trying many other modifications, had finally adopted the form now in use as the best. We may here suggest the value of forming the burners of a slightly-curved instead of a perfectly-straight form. This would still permit of the necessary current of air passing upwards between the flames, and yet show no dark line. Both burners would, of course, have to be curved in the same direction.

It may here be asked—Why not at once turn the flat side of the flame towards the condenser? There are two reasons:—First, by placing the *edges* of the flame towards the front the greatest degree of intensity afforded by the flame is secured. To test this intensity we so arranged the sciopticon as to have a side view of the flame through a series of pieces of coloured glass, four of which sufficed to prevent the light from being seen. When the lamp was rotated so as to present the flame endwise then the latter became visible—a simple mode of testing the visual intensity of a flame. But there is a second reason why the flame should not be presented sidewise, viz., the introduction of distortion by parallax. It is at all times desirable that the flame should be as small as possible so as to secure sharpness in the magnified image. It is, we know, impossible in the present state of our knowledge to produce an oil lamp with any pretensions to intensity the flame of which will be as small as the luminous spot upon the lime of the oxyhydrogen light; yet this should be our aim as far as possible.

The distortion which arises from using a large flame is shown in a most effective manner—probably *the* most effective known manner—by projecting an image full of fine detail by means of a small and intense flame, such as that of the lime light, and then suddenly interposing between the light and the condenser the anterior or outer portion of a parabolic reflector. This greatly increases the volume of light thrown through the condenser; but there is this im-

portant difference—that whereas without the reflector the rays of light emanate from a fixed point, *with* this adjunct they not only come from that point but also from others so far remote as to give them parallelism. The usual effect of this upon the screen is that in proportion as the margin of the disc is approached so does the indistinctness increase. So confused was the definition when trying the experiment described above, in the presence of a leading London enlarger who employs artificial light, that a hand which, when projected by means of the lime light pure and simple, was sharp and distinct became adorned with double the normal number of fingers when the parabolic reflector was used.

If the light is to fall upon the condenser in a parallel direction, well and good; if it is to fall upon it obliquely from a point at its axis, it is also well and good; but the two modes must not be adopted simultaneously. Moreover, if the condenser be corrected, optically, for one class of rays it will not be properly corrected for the other. The effect we have here described is that produced by a flame of large dimensions, although to a less extent. The flame of the sciopticon lamp is, without doubt, very small—at least from the horizontal point of view—and it doubtless possesses as great a degree of intensity as can be obtained from the combustion of mineral oil. Still we think that its bulk might be slightly augmented without greatly impairing those qualities which depend upon the smallness of the radiant. By giving the orifice of each wick-holder or jet a slightly crescented form, as already suggested, two ends would be gained—the flame would be increased in volume and also in uniformity, seeing that the central portion would not then show the dark vertical strip.

The lamp introduced by Mr. Turnbull possesses three straight wicks placed side by side like those in the sciopticon. But the former lamp differs from the latter in this respect—that it is complete in itself, and can burn without any lantern, whereas the sciopticon lamp is, in a sense, part and parcel of that instrument. The flame may be turned either endwise or sidewise towards the condenser; but, in the specimen kindly sent us for examination by Mr. Turnbull, the flames are so far separated as to show to some disadvantage, causing a somewhat pronounced vertical mark on the screen. This, however, is obviated by turning the side of the flame to the front, the only drawback arising from this being the parallax inseparably connected with the use of all large flames. We are not aware whether a slight flickering in the lamp we have examined be a necessity attending the form of construction adopted by Mr. Turnbull; but we have not yet been able to ascertain the precise cause of the unsteadiness. Our esteemed friend, Canon Beechey—who was one of the gentlemen present when the triple-wick and other lamps were burning together, and who from his remarks showed that he was intimately conversant with both the theory and practice of artificial illumination—suggested that the steadiness of the sciopticon lamp would probably be secured by the adoption of a wider chimney. Although we have adopted his suggestion, and have obtained a wider chimney, we have not yet been able to overcome the flickering. The lamp, however, gives a flame possessing much greater intensity than the "duplex," and is slightly superior to the fountain argand, to which reference has been made. When the drawback alluded to has been overcome we shall again report upon the merits of the triple-wick lamp.

It seems somewhat strange that the system of concentric circular wicks in specially-constructed argand burners—such as is adopted in some lighthouses—has not been adopted for lantern lighting. The flames from two such wicks, well supplied with air and concentrated to a small pencil, *ought* to yield a light possessing a great degree of intensity and purity. Who among our numerous enterprising readers will be the first to carry out such a practical idea?

## ON SOME OF THE USES OF MICA IN LANDSCAPE PHOTOGRAPHY.

The present article on some of the uses of mica in landscape photography may be regarded as a sequel to our three articles *On Hobbies*, which have appeared in recent numbers of this Journal, and were addressed more especially to amateurs. We have nothing particularly new to advance at present on the subject of mica in its photographic applications. However it is well, now and then, to make a *résumé* of what has been published at different times in back numbers of this Journal for the convenience of readers who may, perhaps, have forgotten what has been said, or who may have missed seeing it, or who may not have a whole series of back volumes to which convenient reference can be made; besides which, it is important now and then to review what has been done at different times in a new direction by the light of modern experience, and to point out how it may be made available for modern requirements.

Having recommended to amateur photographers to work on small plates by the collodio-bromide emulsion process, and to print in carbon in preference to silver, we will now endeavour to show how they may simplify their operations still more by using mica instead of glass plates, both for positives and negatives.

Although it is extremely difficult to procure sheets of mica of large size sufficiently perfect for photographic purposes, yet this difficulty vanishes when we confine our work to the quarter-plate or *carte-de-visite* size. Very perfect sheets of mica of this small size can now be obtained from many of the leading photographic firms. We need hardly say that they resemble very thin and perfectly flexible sheets of glass, which can be cut by a pair of scissors, and which do not weigh much more than sheets of paper of the same size. A hundred negatives upon such sheets as these could be carried in one's pocket-book, and the convenience of such a vehicle as this in comparison with glass is obvious.

When the *ordinary* dry processes are used sensitive sheets of mica ready prepared would have to be separated by being placed in grooved boxes, otherwise the sensitive films might be damaged by abrasion; but when the sheets are prepared *en route* by simply pouring over them the new sensitive emulsion, and then placing them in the dark slides, no grooved boxes will be required, which will be an immense advantage. It is hardly necessary to observe that the finished negatives may be packed between the leaves of a book, or with paper between them in a small and suitable portfolio. Having thus got rid of glass plates and grooved plate boxes, the paraphernalia of a photographic tourist will be greatly reduced both in bulk and weight. Nevertheless, we do not advise a learner to begin with experiments upon mica. Let him first master the new process upon glass plates prepared at home and exposed upon test objects close at hand, because sheets of mica are delicate to handle and will not bear much experimenting with. The process should have been mastered before recourse is had to the convenience which mica affords to an accomplished tourist.

A convenient way in which to take negatives upon mica is as follows:—Procure an opaque, blackened plate, of any suitable material, cut to the same size as the sheet of mica upon which the negative is to be taken. The object of its being blackened is to prevent blurring by reflection at the back of the film, though the liability to blurring from this cause is probably not so great with mica as in the case of glass plates, on account of the greater thickness of the latter. Then wet the support with water or, better still perhaps, with alcohol; lay the back of the sheet of mica upon it, and press the two into contact with a clean silk handkerchief. This done, pour the emulsion over the mica, and put the whole into the dark slide.

It will be found perfectly easy to develope the image by the alkaline method, without removing the sheet of mica from its opaque black support, by looking *down* upon the image as if it were a positive print, instead of looking *through* it as if it were a negative. We speak confidently on this point, having developed many negatives quite successfully in this way. There is no necessity to hold the plate in the hand during development; it may be placed upon a small evaporating dish, and that upon the top of a wine-glass, so that it can be easily tilted or levelled, and be left for a time quite horizontal, with the liquid upon it, whilst other plates are being similarly treated. As the development proceeds the blacks of the negative will gradually acquire vigour, and will show strongly upon the pale yellow ground

of the film, which is so opaque as to hide the black plate behind it to a great extent. So long as the blacks continue to acquire vigour, and more details to come out in the lights, without fogging, the development must be pushed along by adding, from time to time, a drop or two more ammonia to the developer. No negative can be said to be fully developed or exposed unless the deepest blacks, when dissolved by nitric acid, leave a perfectly transparent space behind.

As soon as the development is completed wash the film, remove the mica from its support, and place it in a saucer containing a fixing solution of hyposulphite of soda; then, as soon as all the silver bromide has been dissolved, pour off the hyposulphite, and wash the film in the same saucer with many changes of water. The film will adhere so well to the mica that no preliminary coating of albumen need be employed; nor need the emulsion be coloured to prevent blurring, which only renders it needlessly slower in this case.

The negative need not be varnished, because in the printing process the film need not be laid in contact with the sensitive carbon tissue. Thus, quite independent of its lightness and portability, mica offers advantages over glass in the comparative freedom from blurring, in the absence of a preliminary coating and also of a varnish, whilst the film is protected from injury in printing by not being placed in contact with the sensitive tissue.

Now we come to printing from negatives upon mica. If the negative be attached by its four corners or edges to a glass plate, with its film next to the glass and its back outwards, it may be used for printing by the single transfer carbon process upon paper, or any smooth white support, or for printing magic-lantern slides, either upon mica or glass.

A good way of printing in carbon upon mica was suggested some time ago by Mr. J. A. Spencer, of the Autotype Company, and is as follows:—Sensitise the tissue by immersion in a solution of bichromate of potash in the usual way, and whilst it is still wet apply it to the sheet of mica, and press the two into close contact by means of a squeegee. When the tissue has become perfectly dry print upon it through the mica from any kind of negative, the film of which must be laid in contact with the mica; and then develope by putting the sheet of mica, with the tissue adhering to it, into hot water. The paper will come off the mica, leaving the carbon image adhering thereto. This must be laid upon a white support, and be viewed through the mica. When thus mounted upon a white card the picture is suitable for an ordinary album. Before mounting it upon a card, or other support, it may, if found desirable, be painted in opaque oil colour upon the film by the method published in this Journal last year, which consists in diluting the oil colours slightly with picture varnish, and applying them with a soft camel's-hair brush. Very beautiful results may be obtained in this way, and with the advantage that the colouring does not hide any of the details of the photograph. When these coloured carbon enamels upon mica are mounted upon card and placed in an album they are safe from being rubbed or soiled, because the back of the mica is outwards.

In concluding this short series of articles on amateur landscape photography we hope we have shown that beautiful results may be obtained by anyone possessing taste and ingenuity, but without any knowledge of chemistry, who will follow our directions and agree to work by the methods and on the small-sized plates which we recommend. Let him not be misled by the remark of any prejudiced photographer to the effect that small plates and pocket cameras are childish; for what, after all, has been the size of the most popular productions of photography hitherto, viz., the stereoscopic slide and the *carte de visite*, but that very size which we now advise him to adopt? We feel persuaded that if amateurs would but follow our advice in respect to processes, appliances, and size of picture, quite a new impulse would be given to out-of-door photography, and their ranks, instead of becoming thinner every year, would receive continually fresh recruits from the attraction which this new, simple, convenient, and inexpensive mode of practising the art *en route* would present.

In an interesting speech lately delivered by Mr. Thomas Hughes, author of *Tom Brown's Schooldays*, on the subject of out-of-door recreations, he alludes to the gradual tendency towards more humane and intellectual amusements which has been developed in the civilised world since the days of the gladiatorial combats in the Colosseum—when men were opposed to wild beasts, or fought together with the cestus, the trident, and the net, for the amusement of a cruel and demoralised multitude—to the present time, when men are content with cricket or polo, and can join ladies in a game at croquet upon the turf. He even goes so far as to deprecate field sports as unworthy of the age, but highly approves of the rifle as a patriotic "hobby," tending, perhaps, more to the security of our country than anything else that could be named. What enemy could ever reach our metropolis, even supposing his hundreds of thousands to have landed safely, against a million of well-armed *franc-tireurs* skilled in the use of their weapon? He does not mention landscape photography as a rational "hobby" and out-of-door recreation, but we think he would have done so had he known more about it practically than perhaps he does, particularly as it bears out so fully his remark in favour of a recreation in which both sexes can equally take a part.

## ON PHOTOGRAPHIC PAPER.

In our first article on this subject we described the process of engine sizing, in which an alkaline solution of resin was brought into contact with the fibre, after it had been subjected to the action of common alum, or sulphate of aluminium. This is, we believe, the way in which photographic paper, as well as most ordinary printing paper, is sized; and, from its nature, it is not likely to interfere in any way in the various processes to which photographic prints are subjected. There is, however, another method of sizing of which we cannot say as much—in which, in point of fact, we think, will be found the source of much, if not all, of the fading hitherto attributed to the hyposulphite of soda said to have been found in mounting-boards. This is called "animal sizing," and consists in coating the surfaces of the paper in process of manufacture with a stronger or weaker solution of gelatine, depending on the nature of the paper required.

The preparation of the animal size, as we saw it carried on, is somewhat as follows:—The *scrous*, or skins, are first placed in vats, each holding about six cwts., and covered with water, in which they are allowed to soak for twenty-four hours, during which time they absorb a large quantity of the liquid, and swell up into a soft, spongy mass. They are then carefully scraped and freed from any trace of lime which may have remained after the process for the removal of hair, fleshy matter, &c. They are again placed in the vat, and covered with water to which has been added from three to four gallons of sulphurous acid, $H_2SO_3$. In this solution the skins are allowed to lie for a considerable time, the result being, of course, the absorption by the spongy mass of a large quantity of the acid, which, from a paper-maker's point of view, is a very great advantage, preserving the gelatine from decomposition for a considerable time before use, and entirely preventing the sometimes strong putrid smell which we have frequently found in paper, the size on which had not been so treated. The acid solution is next run off through a hole at the bottom of the vat, two or three changes of water are passed over the skins, and they are then removed to the boiler.

A somewhat different method of using the sulphurous acid was patented, we think, by Messrs. A. Pirie and Sons, of Aberdeen, and is very generally used throughout the country. It consists mainly in allowing the moist scrous, or skins, to lie till decomposition has commenced, and then checking it by the addition of the acid. By this process a much larger yield of gelatine is obtained; but we fear very much that the result is even more undesirable from a photographic point of view than when the skins are used fresh.

The boiler is a large cylindrical iron vessel, lined with copper, with a space between the metals into which steam is forced, and a lid that fits nearly steam-tight. In this the cleaned and acidified skins are placed, covered with cold water, and the temperature raised to about 170° F., at which temperature a large proportion of

the gelatine is dissolved out. This is run into large wooden troughs, heated by steam pipes, to keep the gelatine fluid, and the skins in the boiler are again covered with water—this time hot. The process is repeated generally five times, the temperature being raised higher and higher each time till about 212° F. has been reached. By this treatment nearly the whole of the gelatine is extracted and the skins of course very materially reduced in bulk, the residue, so far as we could learn, being only useful as manure.

The gelatine so obtained and run into the wooden vats is apparently much too thin for sizing purposes, but rapidly acquires apparent density on the addition of common alum. In the operation we witnessed the gelatine, as it came from the boiler, was hardly thicker than ordinary milk; but, on the addition of alum in the proportion of one pound to each five gallons of size, it, after a few minutes, became as thick as a strong syrup.

The size thus prepared is pumped into a trough, which forms a part of the paper-making machine, and the arrangement is such that the paper, as it passes along, is saturated with it before passing to the drying part of the system.

It will be evident from this, if we have made ourselves understood, that animal size, in addition to gelatine and alum, contains also a more or less variable quantity of sulphurous acid; and to this, rather than to any faint trace of hyposulphite of soda, we are disposed to attribute whatever fading may have been caused by the boards on which prints are mounted.

In the first mill we visited there is no "antichlor" used, the proprietor considering that the chlorine is thoroughly removed by the washing in the poaching engine, and the subsequent hydraulic pressure; and we think he is right, as, on a careful examination of the pulp just out of the press, we found only a faint indication of that body, and a similar examination of the finished paper failed to show a trace of it. But even in cases where the "antichlor" is used, as it is in the mill to which our second visit was made, it is difficult to see how it can be present in the finished paper in any appreciable quantity. As we saw it used it was added to the contents of the poaching engine in the proportion, as nearly as we could calculate, of one ounce to a hundred gallons—not one ounce to eight hundred pounds of fibre, our readers will please to remember, as the fibre bears a much less proportion to the water than did Falstaff's bread to his sack; and even that small quantity is almost entirely washed away. In point of fact, from what we saw we are convinced that there cannot be more than $\frac{1}{1000000}$th part in a sample of well-made paper—a quantity much too small to be worth taking into account.

We are, of course, aware that many experimentalists have found, or supposed they found, hyposulphite of soda in the boards; but, for reasons given below, we are disposed to think they were, in most cases at least, mistaken. We have, during the last month, subjected to careful examination a large number of samples of boards, gathered from various quarters, but in no case did we find a trace of hyposulphite of soda. In a majority of the samples, however, we found sulphurous acid, and in some of them it was present in tolerably large quantity.

Now the tests for hyposulphite of soda usually relied on are its power to destroy the colour of iodide of starch, and its formation of hydrogen sulphide, $SH_2$, in presence of sulphuric acid and zinc. The latter, carried out, as proposed by our esteemed correspondent, Mr. M. Carey Lea, and published on page 157 of our ALMANAC for this year, is probably the best and easiest to manage; but, unfortunately, both fail to discriminate between hyposulphite of soda and sulphurous acid, as the $H_2 SO_3$ gives up its sulphur to the hydrogen quite as readily as does the hyposulphite of soda, and it destroys with equal ease the colour of the iodide of starch.

That the sulphurous acid will promote the destruction of the silver image we have not the slightest doubt. It will do it rapidly if present in large quantity; and, even where the quantity is small, it will be only a question of time and suitable circumstances. The action of sulphur on the delicate image is as well known as feared, and there are so many conditions under which the sulphur of the acid is liberated that every precaution should be taken to keep it from the *matériel* that comes in contact with the print. Chlorine also, as is well known, in the presence of moisture, readily converts the sulphurous acid into sulphuric acid, probably as shown by the equation—

$$2\,CL + H_2\,O + SO_2 = 2\,HCl + SO_3,$$

where two equivalents of chlorine take the hydrogen from an atom of water, and the liberated oxygen unites with the sulphurous, to form sulphuric, acid. We need hardly say that the sulphuric acid so formed will not long remain idle.

The remedy, of course, is obvious. The makers of board intended for the mounting of photographs should take care to use only engine-sized paper, or, if they consider animal size more suitable for their purpose, they should see that it is made without sulphurous acid.

## THE SULPHIDE OF CARBON LIGHT.

THE idea of utilising for photographic purposes the highly-actinic flame produced by the combustion of sulphur and certain of its compounds in oxygen gas, or the binoxide of nitrogen, which has of late been occupying attention, it is needless to say is not a new one.

The proof that such flames can be made to have a higher photographic value than the oxyhydrogen light, and can be furthermore produced at a more economical rate, being at the same time thoroughly under control, if complete, is, so far as I am aware, also not new.

The mere combustion of sulphur in oxygen will probably date from the time of Priestley, at the latter end of the last century, whilst the combustion of sulphur in conjunction with the natural nitrate is an experiment which is said to date almost from times of antiquity, when it is alleged the Chinese were familiar with it. The Greek fire employed in 668 certainly contained a nitrate, and probably sulphur also, whilst the composition of gunpowder (which contains both ingredients) was described in the ninth century by Marcus Gracchus, in a book still preserved in the University of Oxford. The utilisation of oxysulphur flames for optical purposes is, however, a very different thing from the combustion of the necessary ingredients with a view to the production of mechanical force; but this is also said to have been done in the signal lights of the ancient Chinese.

The employment of any artificial light, however old, for the purposes of photography constitutes, at any rate, a novel application, and in spite of any want of novelty in the light itself would fall within the category of new inventions. The first application of oxysulphur flames to such purposes must of necessity be but of recent date, the photographic process itself being only modern. My file of photographic literature being incomplete I am unable with certainty to trace back the date at which such application was first made, and can only go back within my personal knowledge. In his chemical lectures at Owen's College, in 1863, Dr. Roscoe employed the brilliant flash obtained by the combustion of sulphide of carbon vapours and binoxide of nitrogen gas in a glass jar as a source of actinic light wherewith to combine hydrogen and chlorine. In 1866 the writer suggested in the columns of this Journal the possible use for photographic purposes of the flame in question made to burn continuously by the use of such an apparatus as the oxyhydrogen blowpipe jet, and at the same time I advocated the use of sulphur vapours in conjunction with a stream of oxygen for the like purpose.

In September, 1867, the Editors of THE BRITISH JOURNAL OF PHOTOGRAPHY described, with a drawing thereof, an apparatus used by them for this very purpose, and in 1869 the writer exhibited in action to the members of the Manchester Photographic Society another apparatus, constructed by himself, by the aid of which the oxycarbon disulphide flame was rendered perfectly continuous and under entire control.

On the 12th of March, in the same year, a description of this arrangement was given in the pages of this Journal; but neither the writer nor the Editors detailed any experiments whereby the photographic value of the flames produced by their respective instruments might be determined. From that time until within the past few months the matter seems to have been allowed to slumber.

The experiments on the comparative photographic value of various lights recorded by Professor Stebbing in your last are very interesting, not to say surprising. For instance: that the oxysulphur light should be nearly *three* times as actinic as the lime light is more than one would have surmised; and that oxygen should be more efficacious than nitrogen binoxide, in the case of

the carbon disulphide flame, is contrary to the expectations the writer had previously formed. If Professor Stebbing could furnish the quantities of material consumed in a given time in the production of each flame, a better opportunity would be afforded for their economical comparison, as well, indeed, as for their absolute relative values. D. WINSTANLEY.

## INCIDENTS OF THE PAST.

THERE are minds so constructed that they naturally live in the past. Oftentimes their roadway has been twisted and rugged. Incidents have occurred leaving deep impressions, especially at chief turning-points, when new avenues began to open, and their recession from past associations became doubtful. Such minds linger by the way—are sad to let the past go and to proceed onwards. The present only interests them, because it rests not, but retains for them the memory upon which they so fondly linger. In the future they merely see a repetition of past shadows, and cannot be made to hope that the sunny spots of a bygone period can ever repeat themselves. Minds so retrospective can recal the pictures of past life, and make them part and parcel of the eternal now.

Other minds are entirely absorbed in the present; they are moved to light or shade, and their mental pulse rises or falls, by the mere appearances of things as they pass the everchanging point between the two eternities. They never penetrate the past in search of causes, and seldom look onward to anticipate results. They cannot wait, but have their life now. Such are irritable and feverish for present enjoyment, and never make good experimentalists.

Another set of minds—and doubtless the best—look far on to what is to be. They are full of hope and natural immortality. They see in difficulty the budding of success. They perceive in all shadow the necessary counter to all light. They allow their individuality to become absorbed in the general onward movement. They sow and give their labour in order that others may reap. They constantly think, but never for themselves; they are possessed with ideas which fret and wear them until they are realised in form and use. In fact, their whole life is vicarious, and as far as this world is concerned is completely devoted to others. They live that humanity may be richer in thought, while they are poor. They are of those who work on to add to the world's store of knowledge and art, and take no thought of the morrow. In a word, they are men society can never fully repay by all they can do for those left by them to its care.

What has appeared lately in the Journal caused my mind to go back nearly a quarter of a century to a well-remembered incident connected with Mr. Archer, and to another occurrence associated with a gentleman who has just left us for the mysterious life beyond.

I was working hard as a daguerreotypist when I read about pictures being made on glass by collodion. I took the earliest opportunity of visiting London to obtain what information I could about the new method. It was early in August, 1851. Having got Mr. Archer's address, without any introduction but the simple plea of my curiosity and desire for knowledge I called upon him. I soon found nothing more was necessary. I met a thin, pale-faced, over-thoughtful man, possessing a manner so free, unsuspicious, and gentle that in a few minutes all idea of my being an intruder was entirely removed. It was very interesting to note how quickly he plunged into the very centre of his discovery. He was profuse in description (as if I had paid him a fee), and ended with the words—"perhaps you would like to see me make a picture." I was led into the back room on the first floor, in the centre of which was a small chemist's furnace, with everything necessary to give it the appearance of a workroom belonging to a man in search of the undiscovered. Mr. Archer had but a short time before completed the camera which still bears his name, and with it I saw him make the first collodion picture I ever beheld. But Mr. Archer's generosity did not end there. He wrote me a list of chemicals which I was to procure, and told me to use his name at Horne and Thornthwaite's, where I went to purchase them. He shook me by the hand as warmly as if I had been obliging him. The chemists, likewise, made a picture for me. I left their establishment with my pockets full of bottles, and while mounting the omnibus a shower of them went into the street; and thus ended my first experiment in collodion picture-making, leaving a pleasant remembrance of Mr. Archer.

My second incident happened about sixteen years since. I was then in the height of a migratory fit, when I dropped into Wolverhampton in search of a place to cast anchor. I soon made the discovery that Mr. Rejlander was settled there. I at once determined to go somewhere else, but not without calling on the artistic creator of the *Two Ways of Life*. Except in manner, I found him a different man from Mr. Archer. The artist was fresh and healthy in his appearance, with a fine, intellectual head and an expressive countenance. His hands were neatly gloved, and his style was that of a gentleman of easy manners. After some remarks on the prospects of photography, we then passed into conversation on the *Two Ways of Life*. He had no reserve, and, like Mr. Archer, lived far above the world of secrets, suspicion, and dodges. He let me see the first copy he completed, and two sizes made from the first composition picture. Had I seen nothing in these but photography I would not have been charmed; but they were too evidently the production of a man in travail with a great idea. His means were weak and immensely inadequate to accomplish the end he had in view. I saw the picture through the means; I saw the lesson intended. I now believe the idea to be higher and far more complete than the one given in the fine picture, *The Pursuit of Pleasure*. There the artist has all the glory of colour. But as a creation or lesson of life the photograph is the more perfect. We conversed at great length on the possibilities of composition pictures; but it was the man's large heart and complete unreserve that I noted so much.

Is it, then, any wonder that such men die poor? Why, if we look at our social constitution, and study the qualities necessary to secure a balance at our banker's, we will soon perceive that our best men always think of something beyond themselves. Like the potter, they burn their bed to fuse their first silica. Their ideas must live even if they themselves starve; therefore, they leave behind those dear to them exposed in some degree to the bleak, cold air of poverty. It is, therefore, a duty incumbent upon their profession to see at once that the hostages thus left are sheltered, and placed in a position free from carking care and its consequences.

I trust this little narrative may interest some of the readers of the Journal at this time. I find now but few of the early men left. Our "friends, as we get old, become more plentiful in the world to come than in this." JOHN BEATTIE

## NOTES ON PASSING EVENTS.

BY A PERIPATETIC PHOTOGRAPHER.

LET me commence by presenting a small contribution to the discussion on the very important subject of fading of prints. A friend, knowing that I was the fortunate possessor of two prints of a certain kind by a well-known photographer, badgered me, to some extent, to contribute them to a sort of church raffle in which he was interested. On looking over the folio in which they were retained, what was my surprise to find the pictures in a state quite unfit for exhibition, and this not from any visible decay in the prints themselves, but from a peculiar, spotted, mildewed appearance all over the mount. Some prints placed in contact with these were quite free from any defect, either in respect of mount or photograph. So long as mounting-boards of this character are supplied what wonder is it that prints continue to fade? Whether these spots are owing to chlorine, or antichlor, their presence suggests, in a very obvious manner, that to the mounts should be attached a large share of the blame as regards fading now so freely and indiscriminately accorded to photographs. We all know that unmounted prints sometimes fade; let us realise the idea that mounts themselves are also liable to premature decay; and, further, that the agent by which the photograph is attached to the mount also sometimes causes fading—take these considerations into account, and the blame so freely flung at the door of silver printing will become greatly lightened.

It must be placed on record that blistering of prints is to be unknown in the future if to every half-pound of hyposulphite of soda used in the fixing bath there be added one and a-half ounce of ammonia. This, at any rate, is the experience of an American photographer. A period of several years has elapsed since the addition of ammonia to the fixing bath was recommended in this country—for an entirely different purpose, however, viz., the removal of a deleterious organic compound, the presence of which in the finished print was rendered visible by sulphuretted hydrogen. The special action of ammonia as an *anti-blisterant* is said to be the softening of the albumen to such an extent as to cause it to adhere closely to the paper.

As a regular correspondent of this Journal permit me mentally to stretch a hand across the English Channel to grasp that of our French brother, Professor Stebbing. I think that he and I will get on remarkably well together—as well, indeed, as I managed with his much-esteemed Parisian predecessor, my lamented friend Fowler; but he must not take it amiss if I presume to differ from him now and then in an unimportant point or two. If, in taking exception at any time to

his conclusions, I am proved wrong, then I must submit to his castigation. I shall have courted the hand of the flagellator, and must, nay shall, bear the consequences most philosophically. Well, then, Professor Stebbing, in describing, with diagrams, a method by which photomicrographs may be obtained, advises that the ordinary microscope be used subject only to the removal of the "ocular," by which I presume he means the eyepiece. But this allows the tube or body of the instrument to remain, which will prove, in practice, to be a serious nuisance, and for this reason, that if the eyepiece be removed two evils follow, without any compensating feature—first, the field of delineation is terribly circumscribed; and, secondly, the reflection from the interior of the tube is positively "awful." It is a good and wholesome rule in photographic optics that as little of the lens-mount as possible should be allowed between the lens and the sensitive plate; but here we have a long, narrow tube which reflects light on to places from whence it ought to be excluded, and prevents it from falling upon positions where, but for such obstructing medium, it certainly would reach. When a microscopic objective is to be employed in the production of an enlarged image, *minus* an eyepiece, the tube of the microscope must be unscrewed and placed entirely to one side. I write this while negatives of the *Palate of Buccinum undulatum* and of *Pleurosigma angulatum*, taken with and without the eyepiece, are still wet before me, and I imagine that fact gives me the right to speak on the subject. Professor Stebbing is quite correct in saying that the light of the sun can with advantage be replaced by artificial light; and of all kinds of artificial light for photographing microscopic objects I find the ignition of a few inches of magnesium wire the most convenient.

How Mr. Sutton came to forget himself so far as to "pitch into" Archer, by negation, in the way he has done is quite inexplicable. I knew a little about Bingham; but until Mr. Sutton put in the claim he did, I venture to say that no one imagined for a moment that he (Bingham) ever dreamed of putting himself forward as a claimant in connection with the honour of discovering the collodion process. It is exceedingly singular that if Bingham had any cause to consider himself a discoverer or worker out of that process—nay, if he even knew anything really practical about it—he did not hint at it in any *précis* emanating from him at dates subsequent to that of its practical introduction by Archer. Bingham had every chance of doing so, for he wrote treatises in which he might with the greatest ease have enlightened the public as to his share in the introduction of collodion. But not a word of this while he is living; it is only long after his demise that a writer comes forward to make a claim for him that he never made—never would have ventured to make—for himself.

It would have been a very nice thing if, for a guinea a year, the members of the London Photographic Society could have attached to their names "M.P.S.," or other alphabetical hieroglyphs, informing the world of their connection with such an erudite and scientific body; and those who have a weakness in this direction will thank the author of one of the papers read at the recent meeting of the Society for his excellent intentions towards such fatuous members of that august body. But it is not to be so; there is no hope of securing a royal charter. Alas! alas! photography is not recognised as a science; but I do not go so far as to say, with one of my friends, that there is more knowledge of science required in slaughtering and dressing an animal for the dead-meat market than in taking a negative, or even a positive print from a negative.

I have been so fortunate as to see and examine the new French camera named a "*Scenograph.*" It is described by Professor Stebbing as a "pretty little plaything for children," and, in the hope that it may give some of our young men a desire to dabble in photography, he bespeaks a welcome for it; but, seriously, it is a veritable plaything, and quite unsuited for the hard work of practical photography. It is a joltering, little, cone-shaped and silk-covered camera, badly fitted and badly made. Such most certainly was the specimen I had the opportunity of examining.

The discussion on the subject of the new, or alleged new, Steinheil portrait lens has, I observe, been now terminated. Whatever view may be held by the various gentlemen who took part in the discussion, one view has certainly been taken by the readers of this Journal, viz., that a matter with which trade interests were so inseparably mixed up as that of the invention and manufacture of an article of commerce, not unassociated with patents and monopolies, has been discussed in a *dégagé* yet courteous tone throughout—a style of treatment to be commended to the attention of controversialists on other subjects.

*(To be continued.)*

## FADING.

The notes on the fading of silver prints which have lately appeared remind me of an adventure that once befel me many years ago, and which may have some bearing on the question.

After a long spell of luck my pictures suddenly commenced fading, or turning some nasty colour, as soon as they had been washed and *dried.* They seemed all right in the washing water. It was the drying that disagreed with them. Everything was tried. Water from another source was obtained, new silver baths were made, and all the rest of it; but the only remedy—and that an effectual one—was, after removing them from the hypo., to wash rapidly in several changes of water for not more than ten minutes, blot off, and dry at once. Although this seemed to save the pictures, yet it was by no means satisfactory; for then, as now, hyposulphite of soda was held up as our great bugbear and enemy. Some operators, indeed, at that time, were in the habit of advertising that their prints received forty-eight hours' washing—certainly too much of a good thing.

At last, after many experiments, a new sample of hyposulphite of soda was tried. At once everything went right, and the old hypo. was buried in the garden amidst great rejoicing. Moral: Ought the much-talked-of fading of photographs to be always charged on the unfortunate photographer or card-maker? The chemical people may not be quite sinless. I had not the sample of hypo. analysed, and, perhaps, there is even now sometimes a trace of the impurity, whatever it was, that so bothered me. It was obtained from a first-class house, but, I presume, came originally from the large alkali works in the north.

I entirely agree with Mr. Foxlee's remarks in last week's Journal on the more robust constitution of the earlier prints. I have never believed in light salting and weak silver baths. In my practice I use from six to ten grains of salt (ammonium) to the ounce of albumen, and a silver bath seldom under fifty grains. Economy apart, I cannot see the merits of a process of which it is asserted that one grain of chloride of gold will tone ten sheets of paper—a statement which has very recently appeared in the journals—and am not ashamed to confess to the use of nearly one grain per sheet; and I know what I am using, as I make my own chloride of gold.

Russell Sedgfield.

## FOREIGN NOTES AND NEWS.

International Photographic Exhibition at Vienna.—Reduction of Silver Nitrate by Hydrogen.—M. Jaubert's Moist Films.—Processes of M. Alcide.—Dr. Julius Schnauss on the Cause and Cures of Faults in Albumenised Paper.—Dr. J. Schnauss on Dr. van Monckhoven's Developer.—A New Method of Bleaching Shellac.

Our readers must not forget that there is to be an international photographic exhibition at Vienna this year. It will be opened on April 15th, at the *Musée Imperial d'Art et d'Industrie*, and will be closed on June 15th. Works intended for exhibition must be sent to the secretary, carriage paid, during the month of March. A jury will be appointed to award medals and honourable mentions. Five francs per square metre will be charged for wall space. Further information can be obtained from Dr. Hornig, President of the Photographic Society of Vienna, at No. 9, Hauptstrasse, Vienna.

M. M. N. Békétoff has sent a communication to the French Academy of Sciences on the subject of the action of pure hydrogen gas on a solution of silver nitrate. M. Roussel and M. Pellet have arrived at contradictory results, the former gentleman finding that a reduction of the silver takes place, whilst the latter denies this, and attributes the reduction observed in M. Roussel's experiments to an arsenical impurity in the hydrogen. M. Békétoff has, therefore, gone over the whole subject very carefully, using perfectly-pure hydrogen and a solution of silver nitrate which was only very slightly acid and contained no excess of oxide of silver; he also allowed the hydrogen to remain for several weeks in contact with the silver solution. The result of these very carefully-conducted experiments proves, according to the statement of the last-named gentleman, that pure hydrogen *does* reduce nitrate of silver; but he thinks it probable that the action may cease when the solution becomes too acid from the liberation of the nitric acid from the silver salt. Thus—$Ag\ No_3 + H = Ag + H\ No_3$.

M. Jaubert, of Marseilles, states that he can keep his films moist for two hours, or more, by adding a little sugar to his collodion, which he does not find put his bath out of order. He pounds the sugar with the iodides and bromides, and then dissolves the whole

together in alcohol, which he adds to his plain collodion. His proportions are one gramme of sugar for a hundred grammes of bromo-iodised collodion. He says he has used this process for six years, and finds it good.

M. Alcide, of Saintes, who has discovered some new processes for improving collodion negatives without the aid of the retoucher, to which we alluded lately, has communicated them, but under the seal of secrecy, to the editor of the *Moniteur*, who just tells us this much about them, by way of whetting our curiosity to know more by taking out a license, viz., that there are two processes, and that they yield very harmonious and beautiful results. The first is quite mechanical, and consists of certain "dodges" in the printing which are tolerably well known to photographers. The second is more chemical, since it consists in giving certain colours to the sensitive film, and at the same time modifying the action of light upon it.

It may be worth while to give here some of the remarks at the conclusion of a long paper by Dr. Julius Schnauss on the preparation and treatment of albumenised paper. The outcry against the many imperfections of albumenised paper will doubtless last as long as the said paper is used for photographic printing purposes; and, though an experienced printer will have learned to lessen most of them, he knows that an unfailing remedy for them all can no more be given than an infallible panacea for "all the ills that flesh is heir to." These annoying blemishes often proceed, not from the albumen, but from imperfections in the rough paper, improper stowage, or defective photo-chemical manipulation of the albumenised paper. The following hints, gleaned from long practical experience and careful investigation, may, therefore, be of some assistance to such of our brethren as are much troubled by those banes of photographic printers—blemishes in albumenised paper.

1. *Spots.*—The photographic beginner generally remarks these first, when the proofs lie in the toning bath, as a multitude of small, red specks, which become more and more distinct the longer the toning is continued, because the toning darkens the print, while the specks resist the colouring strength of the gold bath, and so seem to become still clearer. In consequence of a brightening of the whole tint of the picture they seem to become less distinct in the soda bath. The expert detects them as soon as the print is taken out of the printing-frame; and an attentive observation of the albumenised paper which has this fault in a marked degree will detect before or after the silvering, or, at all events, before the printing, numerous faint, glistening marks, which foretell the later spots. This certainly proceeds from a predisposition of the paper to spots; and the cause is sometimes to be sought in incomplete secretion of the membranous, cellular substances of the albumen, and sometimes in unequal absorption of the albumenous solution by the rough paper.

According to Mr. Sternfeld, the only two existing German manufactories of rough paper are not able to prepare a sufficient stock of that paper, and the albumeniser is obliged to employ fresh paper in which the size may not be properly dry, thus causing an unequal absorption of the albumen, and, later on, the spots on the picture. Thus, contrary to the generally-received opinion, it seems better to employ paper that has been carefully laid aside for some time. These remarks of Mr. Sternfeld's should be laid to heart by the manufacturers; but it may be said here, in passing, that spots in the paper were a grievance to photographers before the demand for the paper exceeded the supply, and, consequently, before the excuse of not-quite-dry size existed.

It does not lie in the power of the photographer wholly to remove these drawbacks, which belong to the paper; but he may modify them considerably—1. By a fresh and not too weak silver bath. 2. By carefully washing the prints with clean water before the toning bath. 3. By a weak gold bath in sufficient quantity. The fresher and stronger the gold bath, and the quicker it tones, the more apparent the spots become, and, in addition, there is the carbonate of soda deposited by the gold bath, with which it immediately becomes charged. The older gold bath with, for example, acetate of soda occasions fewer pale spots. The toning bath with tungstate of soda is also to be recommended, the recipe for which is as follows:—

| | |
|---|---|
| Tungstate of soda | 20 grains. |
| Chloride of gold | 1 grain. |
| Boiling water ...from | 6 to 8 ounces. |

As soon as the mixture has become cold it may be used. Before every time of using renovate the bath with one grain of gold and one to two grains of tungstate of soda, by which addition it will become useable again in a few minutes.

2. *Blistering of the Albumenised Surface.*—It has been proved that a too strong drying of the albumenised film causes the blisters. The photographer can avoid this defect with reasonable certainty—(*a*) by storing the albumenised paper in a somewhat damp place; (*b*) by drawing a damp sponge over the wrong side of the albumenised paper (of course both sponge and water must be quite clean). The paper may then remain lying until it has become almost dry again. It may then be once more wet, and artificially dried before being placed in the silver bath. The latter should be rather strong, and fresh enough to coagulate the albumen. Blisters are also apt to rise when either the gold or fixing bath is allowed to become too alkaline.

3. *The Repulsion of the Silver Bath by the Albumenised Surface.*—This takes place, especially in hot weather, with too strongly dried, horny albumen, and brings photographers to the verge of despair. It is unquestionable that this fault occurs oftener with doubly-albumenised paper than with single. The latter is, therefore, preferred by many photographers to the double rose-tinted for portraits, especially since the increase in price. It is not unlikely that a better photographic paper will be brought out. Experiments for this end have been set on foot with a solution of shellac in borax, or with phosphate of soda, and not without result.

4. *Single Red Streaks in Toned Pictures.*—One clearly sees that these are agglomerations of albumen—some that has not properly dripped off—or the consequence of the imperfect breaking of the albumen. This could only occur with an inexperienced albumeniser, and happens so seldom that the makers of such sheets should reckon them as waste paper. Red spots on the albumen arise from contact with the fingers, and should not be laid to the charge of the paper.

5. *Faint and Dark Colouring of the Silver Bath through the same Lot of Albumenised Paper.*—If the silver bath be not alkaline or have not become so by long use this appearance will not show itself in any abnormal degree unless the paper be coated with impure albumen, such as an analysis would show to be adulterated with sebacic acids, or to contain, intentionally, some glutinous substance, such as gelatine, isinglass, or gum. To deprive such a bath of colour shake it with kaolin, or charge it with permanganate of potash till of a light, rose-red colour, let it settle, and then filter. To filter gold and silver solutions, as well as strong acids and alkalis, use the so-called "glass wool" in preference to paper. A silver bath of normal strengh will colour far less than a weak one.

6. *The Colouring or Yellowing of Silvered Albumenised Paper* has in part the same origin as the preceding fault. One can keep the albumenised paper a considerable time after the silvering without its turning brown if care be taken not to exhaust the bath nor allow it to become alkaline, to have the storing place of the silvered paper protected from the air as well as the light. A well-sized, rough paper also contributes greatly to its durability.

7. *Deficient Toning of the Print,* which is often accompanied by a greyness of colour and a peeling off of the upper surface, is caused by too weak a silver bath.

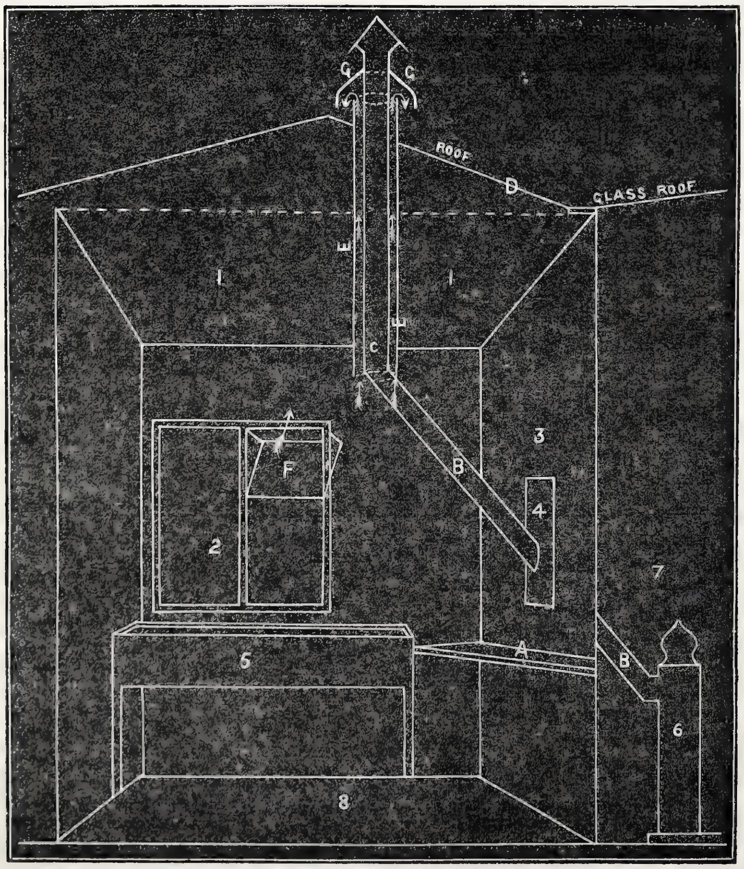
The same gentleman has also something to say about his experiments with Dr. van Monckhoven's developer, which was alluded to some weeks ago in these *Notes*, his experiments giving different results from those of the inventor. The ingredients of the solution given are sulphate of iron, water, and acetic acid, heated to 100° C. The dark-brown colour of the mixture immediately declares the presence of acetate of ferrous oxide; nevertheless, there results from an analysis of a solution of this salt at 50° C. a deposit of ferric hydrate and the evolution of acetous acid fumes. The liquid, if now filtered off the developer before all the oxide salt becomes dissolved, appears of as clear a green as freshly-prepared oxide-free solution of sulphate of iron; yet if heated anew to boiling point its behaviour is different from that of the latter ($Fe\ SO_4$). An acetate is again developed, and simultaneously a deposit of ferrous oxide takes place, which is of a much darker colour than the former deposit. All this manifestly indicates not only the presence of acetate of ferrous oxide, but also of acetate of ferric oxide. Every chemist is aware that the ferric oxide cannot be produced by the prolonged action of glacial acetic acid upon the ferrous sulphate, because the sulphuric acid, being much stronger, does not allow itself to be separated by this means from the ferric oxide; therefore the presence of a basis is required to produce this effect. It (the generation of acetate of ferric oxide) can be done much more quickly by a double dissolution, by the addition of acetate of plumbic oxide or baryta, in which case the sulphuric acid with the aforesaid basis can be deposited as an indissoluble salt, and eliminated by filtration. An analysis of the crystals deposited shows that they contain neither oxalic acid, sulphuric acid, nor iron ammonia. On the contrary, a strong development of

ammonia is found on drying by heat the residue which is left after the evaporation of a test of the developing fluid by potassic hydrate (caustic potash). The presence of a nitrogenous substance not of itself ammoniac was therewith also manifested. Various experiments were set on foot, which are not here described, to discover how to withdraw all the iron possible from the solution without introducing foreign matter in any disturbing quantity. Amongst those indifferent nitrogenous substances which might be suitably introduced into the developer, morphia, albumen, and gelatine may be taken into consideration. The albumen would be sought for in vain, having been already abstracted from the solution in the course of the various cooking operations it had undergone. Alcohol only separates ferrous sulphate from the solution—the extract with alcohol being also tested by morphia, without result; on the contrary, by the addition of tannic acid a strong reaction is produced, the oxidation and precipitation of all the iron takes place, and a watery solution remains. The sediment thus produced is strong, viscous, and yellowish-white, and only discharges itself from a wholly neutral solution; so that, after the addition of the tannin solution, one must add either a trace of ammonia or else a mineral salt, common salt, or saltpetre. This tannin deposit, filtered off, washed out, and treated with an alkali, shows itself indubitably nitrogenous. From this we might justly infer the presence of glue (gelatine) in this developer. At all events, a nitrogenous substance exists in it.

We might also direct the attention of our readers to a new method that has been tried for bleaching shellac. The usual method of whitening it with chlorine changes its chemical properties, so as to render it almost useless for photographic purposes, causing it to become brittle, cracked, and easily peeled off, if no other resin be added to it. The new method, which does not deteriorate the quality of the shellac, is to dissolve it in 90° spirit, and add as much finely-powdered bone carbon as will form a thin pulp; expose the mixture for some days to the action of the direct rays of the sun, shake it up often, and finally filter it, when the solution appears clear enough.

## WARMING AND VENTILATING THE DARK ROOM.

Wishing to warm my dark room and, at the same time, properly ventilate it I have utilised for the double purpose the pipe of the stove which warms the operating room in the manner described in the accompanying diagram.




1. Ceiling of dark room. 2. Window. 3. Wall separating dark room from operating room. 4. Iron plate. 5. Sink. 6. Stove. 7. Operating room. 8. Floor.

The diagram represents the interior of the dark room (five feet by four feet, and seven feet high), with the ceiling and front left out, in order to illustrate more fully the plan described. In order not to interfere with the usefulness of the shelf A, I had the stove pipe made at the angle represented at B, which carries it through the division wall, as marked, to within a few inches of the ceiling of the dark room, where another angle at C is made, in order to carry it up to and through the slated roof D. For the purposes of ventilation and prevention of danger by fire to the surrounding woodwork I have had this pipe from the angle C carried through an ordinary pot drain-pipe E, leaving a clear space of one inch all round, up which ascends into the outer air the bad air of the dark room, whilst fresh air is supplied by the opening F at the top of the window and crevices of the door, &c. A flange G is affixed to the stove pipe above the top of the pot pipe, which prevents downward light, rain, and dirt.

The result of this simple arrangement is that the dark room during winter is always warm and free from obnoxious vapours, &c., whilst I anticipate it will be as cool and pleasant during the heats of summer. Midland Photo.

## ON THE USE OF PHOTOGRAPHIC AND CHEMICAL APPARATUS.

IX.—HEAT MEASURERS—THERMOMETERS.—(Continued from page 42).

It is often desirable, when a thermometer reading is given in one scale to find its equivalent in the other, *i.e.*, to convert Centigrade or Reaumur into Fahrenheit, and *vice versâ*. In most chemical works tables of equivalent temperatures are given; but they are nearly useless, for the calculation required to make the conversion is of a very elementary character, the methods being as follow, the Reaumur scale being rarely needed:—

1. To convert Centigrade degrees into Fahrenheit—*Multiply by* 1·8, *and add* 32 *to the result.*
2. To convert Fahrenheit degrees into Centigrade—*Subtract* 32 *and divide the remainder by* 1·8.
3. To convert Reaumur degrees into Fahrenheit—*Multiply by* $\frac{9}{4}$, *and add* 32 *to the result.*
4. To convert Fahrenheit degrees into Reaumur—*Subtract* 32, *and multiply the remainder by* $\frac{4}{9}$.

Examples.

*Rule* 1. Required the Fahrenheit equivalent of 90° C.—$90 \times 1·8 = 172·0$, which, with 32 added, make 204° F.

*Rule* 2. Required the Centigrade equivalent of 90°—$90 - 32 = 38$, which, divided by 1·8, gives 21·11.

*Rule* 3. Required the Fahrenheit equivalent of 90° Reaumur—$90 \times \frac{9}{4} = 202·5$, which, with 32 added, make 234·5.

*Rule* 4. Required the Reaumur equivalent of 90° Fahrenheit—$90 - 32 = 58$, which, multiplied by $\frac{4}{9}$, is 25·77.

When the degree is preceded by a *minus* sign the rules hold good, care being taken to apply the signs as in ordinary arithmetical use, *e.g.*, $-22°$ F. $= -22 - 32 = -54$, and $\frac{-54}{1·8} = -30$, and so on.

Great care is required in handling these instruments, a very slight concussion being sufficient to break the bulb and render the thermometer useless, for there is no repairing them when once broken. In using them heat or cold should not be applied too suddenly, and upon taking them out of a heated solution they should not be laid upon the laboratory table, as the liquid would be liable to contamination upon the next immersion if the thermometer were not wiped, and by no means should they be placed standing upright upon their bulb. A broad, flat bung with a slit cut into it is a convenient support, and if the slit be deeper at one end than the other (nearest the bulb) the adhering liquid will drain to the bulb and ensure the safety of the finger against corrosive liquids when the thermometer has to be repeatedly immersed in the same liquid; as, for instance, in taking the temperatures in making pyroxyline, &c. and when it is not deemed necessary to wipe it after each immersion. The careful student will see that his thermometer is kept scrupulously clean, and that immediately after use it is washed, wiped dry, and put in its place without delay. When taking the temperature of any liquid the bulb must remain a little while in it in order that time may be allowed for the mercury to become equally heated with the liquid, and as thermometers vary in that respect the student will gain skill by noting the time required for the mercury to become stationary when immersed under varying conditions of temperature. A gentle waving to and fro of the instrument, when allowable, will be of advantage in facilitating the rapidity of indication. In taking the temperature of air a much longer time will have to be allowed than liquids would need. Alcohol thermometers

should not be used for temperatures exceeding 180°, as they would either give false readings or burst. Mercurial thermometers may be used with safety up to 580°.

When the mercury is judged to be stationary the thermometer should be held perpendicularly and exactly level with the eyes, or, owing to the distance between the scale and the column of mercury, the latter might appear higher or lower than the true reading. When one certain temperature has frequently to be observed, to refer again for example to the making of pyroxyline, it will be found very useful to attach an index to the scale to direct the eye at once to the required point. This can readily be done by slipping a small elastic band round the tube, making it rest quite even immediately below the required degree.

In the construction of the best class of instruments very great care is expended, and a wonderful amount of precision has been obtained; the makers even go to the trouble of keeping the tubes for more than a year before filling them, as a certain molecular change occurs in the blowing of the bulb which renders the indications liable to alteration if new tubes are used. Some knowledge of the mode of testing thermometers is most desirable, and some of the most easily-applied tests may now be named.

It is important that the tube when filled and sealed be entirely free from air. The degree to which this requirement is fulfilled will be seen upon inserting the instrument and noting how the mercury runs. It should run to the end of the tube quite freely (though it may stick at first and a slight tap or swing be required to start it), and if it be quickly placed to the ear a distinct, though faint, "ping" will often be heard as the mercury strikes against the end of the bore. There will then be left a small vacuum bubble in the bulb, which, upon re-inverting the thermometer, should entirely disappear. If all these conditions be fulfilled the instrument may be considered perfect in that respect.

The next point is the correctness of the gradation. The freezing point should first be tried by immersion of the instrument in a mixture of pounded ice or snow and water. After remaining there for at least five minutes the top of the mercury should exactly correspond with the 32° of the Fahrenheit or the 0° of the Centigrade.

The boiling point is a matter of greater difficulty, and where excessive accuracy is desired it should be taken after the lapse of some interval of time after taking the freezing point. It varies according to the height of the barometer, a difference of one inch in the height of the mercurial column causing a difference of 1·71° F. in the thermometer (the standard height of the mercury for taking the boiling point is fixed by Act of Parliament at 29·922 inches), and any difference must be calculated and allowed for at the time of making the comparison. Metal vessels are the best for boiling the water, as the temperature of their contents is constant, while with glass vessels the heat of boiling is variable to the extent of several degrees at times. But with certain precautions glass vessels may be used, and, as they are the kind most likely to be available for the readers of these chapters, their use only for the purpose will be treated of.

A glass flask holding about a pint should be half filled with water, and a number of pieces of charcoal introduced. The thermometer is inserted through a cork which fits loosely in the neck of the flask, and it should rest immediately above the surface of the liquid, as the vapour of the water, and not the water itself, is used to obtain the temperature. The cork should have two wide grooves or slits cut into it to allow free escape for the steam, or the varying pressure would cause varying temperatures. The water should now be boiled, and after the expiration of five or ten minutes the thermometer carefully observed to find whether the mercury coincides with the 212° Fah. or 100° C. marking, allowance being made as described for the height of the thermometer.

When the student, through distrust of his own skill or other causes, does not make this testing himself, and yet requires a thermometer of the utmost accuracy, his best plan is to ask the maker to send it to Kew to be tested, the authorities of which place will do this for a small fee of a shilling or two, and will give a written "character" to the instrument, stating exactly how much it varies from absolute correctness for all the points of the scale.

G. Watmough Webster, F.C.S.

## Our Editorial Table.

Views in America. By W. J. Stillman.

It will be in the recollection of our readers that when Mr. Stillman sent us his interesting *Notes from America*, which we published in the last number of our last volume, he accompanied that communication with a number of prints from various negatives taken by him on his excursions during his recent visit to America under circumstances there described, and to which we propose now to refer.

Mr. Stillman left England in July, taking with him a quantity of sensitised emulsion with which to prepare plates *en route*. That Mr. Stillman has spent much time in laborious experimenting, in order to simplify and render more certain collodio-bromide emulsions, we have informed our readers from time to time; and we have also placed on record the fact that his efforts were, last spring, crowned with success, as he had then perfected an emulsion which, when poured upon the plate, yielded a film ready for exposure in the camera without either washing or preservative. And here let us tender an apology to this energetic fellow-worker for having by a pure accident omitted in our annual summary of progress to do him that justice to which he is so well entitled—an omission discovered too late to be rectified in the proper place, and which, fully recognising all his earnest labours, we now hasten to supply.

A particular kind of emulsion made upwards of a year ago by Mr. Stillman possessed the valuable property of being insensitive to light, both while it remained in the bottle and after a plate was coated with it, until it was dipped in water, by which procedure the light-obstructant was removed, the plate in consequence acquiring sensitiveness. This we thought at the time, and still think, a principle of too much value to be entirely discarded, for there are many circumstances under which it may be most useful to have an emulsion possessing this property; but we are also very well aware that it must yield in popularity and also in general utility to the emulsion more recently perfected by Mr. Stillman, a very important feature of which is that the mere act of pouring it upon a plate of glass, without any further operation whatever, suffices to complete a sensitive plate ready for exposure either at the time of preparation or months, perhaps years, afterwards.

It was with a collodion emulsion of this description that the pictures were taken which are now upon "Our Editorial Table." Mr. Stillman being, by profession, taste, and education, an *artist* in every sense of the word, it is unnecessary for us to say that they fulfil all the requirements of composition, being perfect in this respect; not only so, but the subjects are selected with an eye to beauty of effect.

Not being named, we are unable to definitely designate specific pictures; but two river or lake scenes possess exceptional excellence. In one a road, separated from the water by some lofty trees, winds along on the left—a house which seems to be set in the water peeping out in the middle distance on the right. In a second, a grove of trees upon what appears to be a little island arrests the eye as the central subject in the composition, weeds, rushes, and other aquatic plants filling up the foreground; while in this, as in the former picture, the stillness of the water renders the reflections of both trees and houses so perfectly that it is very difficult to say where physical nature ends and reflected nature begins.

To a view taken in the interior of the house of Longfellow we naturally attach much interest, indicating, as it does in the most palpable manner, the residence of a man of cultivated taste. Another picture—the birthplace of Oliver Wendell Holmes—also possesses an intrinsic value different from, and in addition to, the pictorial merit displayed in the work. A third picture is intimately associated in name with one who "lives in fame though not in life," representing as it does the *Washington Elm* in Cambridge, Mass.

From memoranda on each picture we learn that the instrument by which this series of views has been taken was the new Ross symmetrical lens, for the most part the full aperture being used.

## Meetings of Societies.

### LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The ordinary monthly meeting of this Association was held on Tuesday evening, the 26th ult., at the Free Library, William Brown-street. Owing to the absence, through illness, of the President the chair was taken by the Rev. H. J. Palmer, Vice-President.

The minutes of the annual meeting were read and confirmed.

The Chairman gave an account of a visit he had paid to Mr. Kennett, and the manner in which that gentleman prepared his gelatine plates. He (the Chairman), in reply to a question, said that he was much pleased with the pellicle, but he had no doubt that one great reason of non-success of many new workers with it was owing to the length of time the film took in drying. Mr. Kennett had, however, no difficulty in getting his plates dry in from two and a-half to three and a-half hours; for his preparing room was kept at a heat of 65° to 70°, by the aid of a

flat tin dish filled with water and heated with a spirit lamp. When the plates were prepared and set they were placed in racks round the room, and the moisture, not being confined, evaporated rapidly. Seeing this he (the Chairman) had abandoned his drying cupboard mentioned at the last meeting. The plates should not be placed on the hot water bath, but at a little distance from it. If put near too great a heat the moist gelatine had a tendency to liquify and run off the plate, besides being liable to blister during development. By the above method it was only necessary to keep the plates level for a few minutes until the film had set; they could then be placed in racks in the usual way.

Mr. Ellerbeck said he had tried Mr. Green's suggestion of using chloride of calcium in his drying-box, but it did not answer with the gelatine plates.

A vote of thanks was passed to the Belgian Photographic Association for their gift of the numbers of the *Bulletin* to the library of the Society.

Mr. Atkins called attention to the albums of the Society, suggesting that the beginning of the year was a good time to make donations of prints and portraits to the albums.

It was arranged that Mr. J. H. T. Ellerbeck should exhibit some chemical transformations by the aid of the sciopticon at the February meeting.

The presentation print for 1874 was then distributed, being a view of *Rydal Water*, excellently printed in carbon by the Woodburytype Printing Company from a negative by the late Mr. Carlyle, of Grasmere, lent by Mr. J. A. Forrest.

The meeting was shortly afterwards adjourned.

## Correspondence.

### THE SCIOPTICON AND TRIPLE-WICK LAMPS.

*To the* Editors.

Gentlemen,—I notice in your last issue of the Journal a letter from Mr. W. B. Woodbury, in which he makes several statements to which I claim the right to reply.

When I read the paper spoken of before the Edinburgh Photographic Society I had not the slightest intention of bringing my lamp before the public commercially; and it was only when solicited by my friends to get lamps made for them, and also having letters from all parts of the country inquiring where the lamps were to be got, that I had a supply made. That paper was the result of a great deal of hard work and a great number of experiments—made not once, but renewed again and again—and there is not one word in it I would care to retract.

Mr. Woodbury evidently feels annoyed at my taking any notice of the sciopticon at all; but I maintain that I had as much right to notice it as any other lamp used for the lantern. He cannot complain that I have done his sciopticon injustice, seeing that I have made it equal to forty-two and a-quarter candles, while Mr. Pumphrey has given its value in the last two editions of his catalogue as thirty-seven candles. The difference in the result is easily explained away; I gave all the lights higher value owing to the lens used. I know Mr. Woodbury advertises the sciopticon light as equal to fifty candles, and it has also been spoken of as giving three or four times the light of an ordinary lantern, which, in sober truth, it does not, as the focus of the lens used makes all the difference in the world. As I have all along given the focus of the lens, perhaps Mr. Woodbury would kindly favour me with some particulars of the lens by which he makes the sciopticon equal to fifty candles. By using a lens of long focus the light can, according to the usual method of photometric calculation, equal anything you choose; but I distinctly deny that the sciopticon is equal to fifty candles with any of the lenses usually used.

Having said so much, I will now turn to the one grand and crowning experiment by which Mr. Woodbury condemns my lamp.

It is a well-known principle in photometric experiments that the two lights to be compared must be burning under exactly equal conditions, and in reliable experiments great care is taken to see that they are so. The lights were not burning equal in this case, as I will now show.

If anybody will take the trouble to make the following simple experiment they will understand the whole matter:—Take two pieces of thin board, thick brown paper, two mounting-boards, or any opaque body that is at hand, and hold them one at each side of a gas jet or common candle; put them about four inches apart, and direct the light on to a wall five or six feet distant. It will be seen that the light is greatly increased in that direction; for if they be rapidly removed, the eyes being directed on the wall, this will be more apparent. Mr. Woodbury's light was, in fact, burning in a sort of tube, viz., the body of the sciopticon, which more than doubled the light in the direction of the ends of it, while my lamp was burning with the light exposed in all directions.*

I have never said that my lamp was fitted for burning anywhere out of the lantern, and it was burning to no advantage when Mr. Woodbury tried it; on the contrary, his had the light doubled by the tube in which it was burning. So much for equal conditions.

Mr. Woodbury also took the wrong way to compare the shadows. The shadows should have been made quite equal by shifting the lights, the distances being then measured and squared. His method of testing lights—namely, Rumford's—is also the most unreliable of all the different ways of estimating light. See my paper on the subject.

The only way in which these two lamps can be equally tested is to put the discs together on the same screen, using lenses of the same aperture and focus. This has already been done—not once, but several times.

But I am prepared to prove that the light of my lamp is not only equal to that of the sciopticon, but a great deal better, and that it will do what the sciopticon cannot do, namely, give an evenly-lighted disc without any shadow on the screen.

I need not go over the result of the trial of the sciopticon with my lamp in Mr. Ross's establishment, to which he kindly challenged me. It has already been given by Dr. Nicol, some weeks since, in the Journal. I may only add that I will repeat the trial at any time it may be deemed proper.

It may be thought from this that I am interested in the sale of this lamp. I have only to say to this that my business is that of a photographer and not that of a lamp manufacturer, and that, commercially speaking, I do not care one brass farthing whether I ever sell another lamp or not. The use of the lamp is perfectly unrestricted by patent or anything else, and anybody who chooses can make them and sell them by hundreds if they like.

Mr. Woodbury also says that the blowers or cover of my lamp is only part of the flame chamber of the sciopticon. There is no part corresponding to the cover of my lamp in any part of the sciopticon, the bottom part of the flame chamber being quite different. The provisional patent taken out by Mr. Woodbury for the sciopticon having long since expired I might have copied it; but I have not done so. He also says that the use of three wicks is not new. I may say that I entirely agree with him. It is now exactly twelve months since I first exhibited this lamp before the Edinburgh Photographic Society—being noticed at the time in the journals—and some time longer than that since I first made it, and therefore it can hardly be called "new." Again: he also says that three wicks were suggested to him by various gentlemen. It is very evident it never got beyond the stage of "suggestion." Should I be mistaken, I have no doubt Mr. Woodbury will be happy to give the name of the gentleman who suggested and made a lamp such as the one in question.

To conclude: I will just say that I will continue to insist that my lamp is the best light used for the lantern until something better is brought forward to beat it.—I am, yours, &c., J. M. Turnbull.

*Edinburgh, January* 25, 1875.

[Some observations on lamps and lighting will be found in a leading article in this number.—Eds.]

### THE NITRE-SULPHUR LIGHT.

*To the* Editors.

Gentlemen,—In his last letter to you, dated 25th ult., Professor Stebbing gives you an early copy of a communication *On Artificial Lights Serviceable in Photography*, which (he says) "is to be laid *to-day* before the French Academy of Sciences."

The authors (MM A. Riche and Ch. Bardy) describe certain modes of effecting the combustion of sulphur which have given high photometric results, as shown in a comparative table appended to their statement. As one of these is absolutely identical with the nitre-sulphur light which I exhibited at a meeting of the Photographic Society just a fortnight previously, and which was fully described in your Journal of the 15th ult., I beg permission to claim for myself priority of publication.

Your readers will see at once the close analogy or identity of the whole arrangement if I quote a few lines from the French experimentalists' account. After describing a mode of burning sulphur by directing upon it a stream of oxygen, the writers proceed to say—

"The oxygen can be replaced in the following manner:—Fill the crucible with nitrate of potassium; put under it a Bunsen burner, and when it begins to decompose throw small pieces of sulphur upon its surface. A very brilliant white light is produced, but its photogenic power is less than the former."

I have my doubts about the correctness of the opinion expressed in the last few words; but all the rest is but a concise description of the light recently shown by—Yours, &c., John Spiller.

*London, February* 2, 1875.

### KENNETT'S PELLICLE.

*To the* Editors.

Gentlemen,—I am glad to find that Dr. Nicol repudiates the notion that he is an enemy to patents; in fact, he considers them excellent and necessary. I confess, however, I am wholly unable to understand the subtle distinction by which he would exclude from their protection, with few exceptions, photographic inventions. My letter was written solely to enter my protest against the too prevalent habit of running down everybody who takes out a photographic patent, as well as the

* In our sciopticon, and in all those we have seen, the body is made of blackened iron, and certainly does not act the part of a reflector. We mention this in case there may be a kind of sciopticon now being made other than that which we described in our volume for 1873.—Eds.

pronouncing offhand infallible decrees on legal rights on what must of necessity be loose and inaccurate grounds. Dr. Nicol must excuse me if, in all courtesy to him, I decline to be drawn into a discussion of the validity of Mr. Kennett's or any other person's patent. To argue a question of legal right before a tribunal (if, indeed, there be in *this case* any tribunal at all) which has neither the capacity to collect the facts nor authority to pronounce a binding judgment is a fruitless occupation and a waste of time.—I am, yours, &c., P. Le Neve Foster.

*February*, 2, 1875.

## SUTTON'S PATENT ALBUMENISED PAPER.

*To the* Editors.

Gentlemen,—I feel that Mr. Lampray's letter, at page 48, requires a few words from me to say that I am in no way responsible for any statements which Messrs. Ordish and Co. may make in their advertisements in reference to my patent albumenised paper, not having had any transactions or correspondence with those gentlemen for many years, and never having prepared a single sheet of the paper for them.

What Mr. Lampray says about having bought my patent for £100, and my having prepared the paper for him in Jersey, previous to its being albumenised, for several years, is perfectly true, and our relations were very friendly to the last. But Mr. Lampray gave up business for a time, for reasons with which some of my readers are, no doubt, familiar; and at that time, his patent having expired, his old partners, Messrs. Ordish, wrote to me inquiring whether they might make the paper and call it "Sutton's patent." To this I replied that I had no control over the matter at all. If they still have my letter, and choose to publish it, they are perfectly welcome to do so. But I never manufactured for them a single sheet of the paper, nor had I any power to appoint them "sole agents" for the sale of it or any interest in so doing—I simply answered their letter in a friendly spirit, supposing that Mr. Lampray had given up business for good.

That is all I know of this matter, and, of course, no blame attaches to me for any statement which Messrs. Ordish and Co. may now insert in their advertisements. But if they think that my memory deceives me in this matter they are at perfect liberty to publish my letter to them on the subject.

In conclusion: it may amuse your readers to know the following details of what occurred between myself and Mr. Lampray respecting this patent paper:—

Having discovered and proved that the treatment of plain paper with india-rubber before albumenising it was a good thing, and believing the idea to be original, I wrote out the specification and sent it to a patent agent in order to obtain a patent for it. I believe Mr. Johnson, the editor of the *Mechanics' Journal* was the agent, and he made inquiry and pronounced the patent good. I then offered the patent to Mr. Lampray for £100, giving him the preference over other makers of albumenised paper because I had previously received some very excellent paper from him. He replied, like a cautious man of business, that he must see first what my invention was worth; so he sent me a sheet of plain paper marked on the back, which I was to prepare and return to him to be albumenised, after which it was to be returned to me and printed upon, as a specimen, and then be sent back to him. I looked over all my boxes of negatives to see which would give the best print, and chose—which one do my readers suppose? A wet collodion one upon a flat plate, of course. No; not a bit of it. Although £100 turned upon the experiment I chose a panoramic negative upon a curved glass, taken by the gum dry process, which I had just before described at a meeting of the British Association. That identical negative is now before me. It is a view of St. Brelade's Church, Jersey, including 90° of angle, and some hundreds of proofs have been printed from it and sold in the island. I prepared the piece of paper, 9 × 5, for Mr. Lampray, and he albumenised it and returned it to me. That same evening I excited it upon an eighty-grain bath and printed it in the sunshine the next morning. It was toned with a solution of chloride of gold to which some bleaching powder had been added, and was fixed in fresh hypo., washed under the pump for five minutes, dried, and returned to him the same day. I do not think I ever saw a finer print. He replied by sending me another sheet of paper, marked as before, for a second test. This was printed from the same negative, in the shade, and was as good a print as the first. And lastly, in order to be quite sure of what he was about, he sent me a third sheet. This was printed from the same negative, in a pouring shower of rain, protected by a plate glass, and the proof turned out just as good as the other two. In fact, there was not a pin to choose between the three. So the experiments were deemed satisfactory, and the bargain was concluded.

I am sorry to see, in an article by Mr. Wenham in this year's British Journal Photographic Almanac, an attack upon the panoramic lens. He pronounces the instrument optically perfect, but says (page 42):—

"Though optically perfect, yet the difficulties attendant upon the use of such lenses are insuperable. That of huge, curved, sensitised plates requires no comment," &c.

To this I reply, for the hundredth time, that the difficulty of manipulating curved glasses is purely imaginary, and that it is just as easy to work upon curved glasses as upon flat plates, and also to print from the same. If Mr. Wenham had ever really tried the experiment he would know this to be true. At any rate, I hope to convince him of it next time we meet; for it is a pity that the most perfect view lens in existence should be condemned to lie on the shelf through the mere dread of a difficulty which is imaginary.

It has been said that the patent for my paper was not valid. The same thing has been said of nearly every patent for an improvement in photography which has ever been taken out; and we have had a discussion lately about a patent in your Journal. Mr. Lampray was quite as likely to be well-informed on that point as myself, and he had ample opportunity for making inquiry before purchasing the patent.

A few months after he had bought the patent, he asked me whether I could make the paper for him. I agreed to try, though rather against my own inclination; so I hired a Martello tower from the government, and set to work. After a few failures in the first ream I succeeded; and then, having engaged a clever workman for the job, the manufacture went on smoothly enough, and continued for three or four years.

Now your readers are in possession of all that I can distinctly remember respecting the matter.—I am, yours, &c.,

*January* 25, 1875. Thomas Sutton.

## WARNING.

*To the* Editors.

Gentlemen,—Will you allow me to caution photographers against a person calling for silver cuttings, chloride, &c., who takes the stuff, promising to pay, and never remits.

The same person has also obtained spare lenses and cameras, &c., with like results. Even when he pays the price is quite inadequate.—I am, yours, &c. Samuel Fry.

*Surbiton, S. W., February* 2, 1875.

## "A PERSONAL EXPLANATION."

*To the* Editors.

Gentlemen,—I was considerably astonished on reading Colonel Stuart Wortley's letter in to-day's issue.

He says:—"Many ask that I should at once publish all the results of my experience." Now, in your Almanac for 1874, Colonel Wortley advertised the publication of a book, which was to be ready early in spring, containing full details of his mode of working, and, consequently, the results of his experience. I, along with others, sent my name to Colonel Wortley as a subscriber to the work; but from that day to this I have never heard a word about it.

From his last letter it appears that all idea of issuing the book has vanished; if so, I think a word of apology is due from Colonel Wortley to those who expressed their willingness to take it, and I think some explanation is also due, not only to subscribers, but also to yourselves, for the non-fulfilment of the advertisement.

Apologising for troubling you—I am, yours, &c., Inquirer.

*Liverpool, January* 29, 1875.

[The above is one of several letters we have received on this subject.—Eds.]

## AMATEUR PHOTOGRAPHY, &c.

*To the* Editors.

Gentlemen,—In this week's issue you again direct attention to the decline in the number of amateur photographers. It may be difficult to arrive at the proper solution of this; but it appears to me that perhaps the principal reason is the *novelty* of the art is gone, and it is now a very commonplace thing to be able to photograph. I do not say "well and *artistically*," but to go through the routine. Besides, the art has somehow become so associated with bagmen and showmen that it is no longer considered a fit occupation for a gentleman's leisure.

I admit this is very unreasonable, but it is, I believe, a very prevailing sentiment with the public; and the reason for the decline is the unfortunate disposition amateurs have of trying every new process and wrinkle, and (I speak from my own experience) never attaining very much excellence in any one process practically, however perfect they may be in it theoretically. There is also the constant war at home against the rapidly-accumulating *impedimenta* of lenses, cameras, baths, and bottles, which soon get antiquated without being able to be got quit of, either from a lingering affection for this and that or the difficulty of realising. And this reason I feel, in my own experience, is the difficulty with landscapes of getting with the camera any more than a *bit*, while with my palette I can secure a fairly-arranged subject.

You solicit suggestions for the future; and I, therefore, as an amateur of fully twenty-eight years' standing, venture to offer you my opinion.

Ever since reading Professor Piazzi Smyth's article on his camera and negatives of the pyramids, and seeing these in some cases no larger than a shirt button on the plate, and enlarged by the electric light, I think, to

at least forty feet square, I am convinced that the future of amateur photography should tend in this direction—not necessarily wet collodion and cell slides, but in the employment of some small camera constructed specially for the purpose, *with its relative apparatus for enlarging*, the one specially constructed for the other, and not a makeshift.

Then, again, for the negative: amateurs would rest their practice on your experience and judgment as to the best dry process now to use of all the many modes which have appeared in your Journal, and a concise description for their guidance would be necessary, or, at least, save reference to back numbers of the Journal.

Further: I would have you to remember that amateurs have not the time, and do not care to go in for extensive reproduction of their negatives, all they really require being some process for having a perfect (?) positive in their album, with the means of gratifying a friend with an occasional copy. Such is my idea gathered from a pretty extensive experience of the whole art and its amateur practitioners.

I am asked to photograph some engravings which are spotted with mildew, &c. I propose to bleach them first. I have tried it occasionally, but never very successfully. Might I ask the favour of your chemical knowledge and experience to detail to me the best and safest method to employ to bleach these engravings before copying them? I have found that I always abstracted the size from the paper, and it became brittle and broke away in my hands, however delicately handled. Should the chloride of lime be always *freshly* prepared? or can I make a solution and use it over and over again? I have latterly used hydrochloric acid instead of sulphuric acid; but I think it weakened the paper more, and left curious stains on it, which may develope into something serious by-and-by. I used carbonate of soda for the last wash to kill any remaining acid.

Kindly give a description in your Journal of the best way of bleaching prints; for, if I mistake not, from the interest many of my friends, photographic and others, have taken in my efforts in this direction, there is a pretty wide curiosity in reference to the matter.

I cannot close without expressing to you the pleasure I derive from your Journal as well as from your ALMANAC. I ventured to constitute myself a grumbler and critic of your pages lately; but when one reflects on the difficulty, I would suppose, of providing fresh pabulum for your readers every week the reading public should be slow in animadversion and gentle in criticism, and so should be—Yours, &c., SCOTUS.

## EXCHANGE COLUMN.

I will exchange a table pianoforte, in first-class condition, for a posing-chair or any other photographic accessory.—Address, J. M. B. M , 47, Leigh-street, Earlestown, near Warrington.

I will exchange a large lantern and quantity of good slides (by Pumphrey Brothers) for a wide-angle rectilinear or wide-angle doublet, about 8 by 6.—Address, JOHN CHEAL, Reigate.

I will exchange side slips equal to new, by Marion and Co., London, for others in fair condition, or for a *carte-de-visite* cameo press, or interior background.—Address, J. McKENZIE, Thurso.

I will exchange a mahogany-bodied magic lantern, with 4½-inch condenser and oxyhydrogen jet burner, for a good landscape and view lens, by Ross or Dallmeyer, or No. 3D lens.—Address, JAMES DENTON, 70, Sheffield-road, Barnsley, Yorkshire.

## ANSWERS TO CORRESPONDENTS.

☞ ***Correspondents should never write on both sides of the paper.***

F.—Try Deacon's, in Leadenhall-street.

QUERIST.—The committee have decided upon not publishing any report.

R. BRIDGART.—We shall make the required trial as soon as the lenses arrive.

LUX (Clapham).—As we cannot decipher your letter, write again, but more legibly.

J. V. K.—Thanks. The pictures are very good, especially that of the lady and child.

NOVICE.—The developer is by far to weak. You must have mistaken drachms for grains.

READER.—Enough has been said already, and the matter had better not be reopened.

A. K.—There being no patent for the photolithographic process no license is, consequently, required.

C. H. E.—It is usual, and only right, that photographers should return the specimens sent by operators when applying for a situation.

G. S.—Your communication could only appear in our advertising columns, and before being inserted there it must be purged of its personalities.

GEO. ROSS.—You may make the modification proposed; but bear in mind that the retarding influence of a grain of citric acid will equal that of a drachm of acetic acid.

MARY B———.—It was fortunate that you obtained from the pawnbroker a written guarantee of the genuineness of the lens, for it was scarcely unwrapped before we saw it to be fictitious and the name to be an impudent forgery. This was confirmed after a very slight examination. We have returned it as directed.

X. Y. Z.—We should like to know in what manner you use tannin with gelatine as a preservative for dry plates, because the former converts the latter into leather.

H. W.—We have always endeavoured to avoid the introduction of pitch or tar into our bath, hence cannot give the information required. A coating of wax we know to be excellent.

E. S.—Develope by means of alkaline pyro., the formula for which will be found in our ALMANAC. Acid or neutral pyro. may also be employed, but a longer exposure will be necessary.

J. M'Adam.—The cause of the varnish dissolving the collodion film is to be found in the strength of the alcohol employed as a solvent. By adding a drop or two of water per ounce this tendency will be overcome.

J. W. SYKES.—1 and 2. No special apparatus is required for carbon printing. —3. Full information has been published; but should you experience any difficulty we shall be happy to give such hints as may be required.

T. ALLEN (Jamaica).—The publisher will attend to the business portions of your communication. Any of the leading makers of apparatus will supply you with the fittings required for the camera stand. We cannot obtain the desired information respecting a grooving plane.

JOHN GUNSTON.—1. Unless you can obtain the salt from the dealers you will have to prepare it yourself.—2. Practical instructions in all the branches of carbon printing, about which you inquire, will be found in a chapter specially devoted to it at page 41 of our ALMANAC for 1873.

W. T. F.—If you copy the portrait, you render yourself liable to be proceeded against for piracy; and from what we know of the possessor of the copyright he will not be slow in vindicating his rights. If you cannot produce *from life* specimens fit to be exhibited, why not obtain a few lessons?

OLD PHOTO.—A license for keeping a still on your premises costs ten shillings a year even if you distil nothing stronger than water; but if the excise were well assured that it was to be confined to the purpose for which you desire it, we believe that a license fee would not be demanded in your case.

F. B. (Holloway Road).—The North London Photographic Association ceased to exist several years ago, and no association of this kind now exists in the North of London. Many of the members, however, of the South London Photographic Society (which is a misnomer in regard to the name) belong to the North of London. No fewer than three of the five vice-presidents reside in your quarter.

W. W. G.—We do not think that peroxide of hydrogen is used by professional printers. Indeed, so far as we know, it never got much beyond the experimental stage. You are slightly confusing the names of the introducers of the peroxide and hypochlorite methods of eliminating hyposulphites. The name of Dr. Angus Smith is connected with the former, and that of Mr. F. W. Hart with the latter, method.

RECEIVED.—H. B. Berkeley; Thomas Forrest; W. B. Woodbury; and R. Dighton.

LECTURE ON CHINA.—On Saturday evening Mr. J. Thomson, F.R G.S., delivered a lecture *On China*, at the Hall, 9, Conduit-street, W., before a select audience, consisting, for the most part, of representatives of the metropolitan press. There was a considerable attendance. The lecture was illustrated by the exhibition of a large collection of photographs shown on the screen by means of the lantern, and at the close a vote of thanks was awarded by acclamation to the lecturer.

IMMENSE PHOTOGRAPHS.—Photographs have been made of the new Opera House, 4 feet 3 inches in length, and 3 feet 4 inches in height. They were obtained in one single piece, by well-known processes, and with the aid of a large and specially constructed camera. All the lines of the pictures are of remarkable excellence, the mouldings, the busts, the medallions, and even the minutest details being reproduced with rare perfection. The attempt is being made to secure pictures even larger than this.

## METEOROLOGICAL REPORT,

*For the Week ending February 3, 1875.*

Observations taken at 406, Strand, by J. H. STEWARD, Optician.

THESE OBSERVATIONS ARE TAKEN AT 8.30 A.M.

| Dec. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 28 | 30·19 | W | 45 | 47 | 53 | 44 | Dull |
| 29 | 30·30 | W | 49 | 50 | 52 | 46 | Dull |
| 30 | 30·54 | NE | 48 | 40 | 44 | 40 | Cloudy |
| Feb. 1 | 30·37 | W | 35 | 36 | 49 | 35 | Cloudy |
| 2 | 30·26 | NW | 35 | 35 | 45 | 35 | Foggy |
| 3 | 29·91 | NW | 37 | 38 | — | 37 | Foggy |

CONTENTS.

THE BRITISH

# JOURNAL OF PHOTOGRAPHY.

No. 771. Vol. XXII.—FEBRUARY 12, 1875.

## CRAYON STIPPLED EFFECTS.

Among those topics which, comet-like, occasionally rush across the photographic firmament, become a "nine days' wonder," and then subside into the level of everyday life, is that method of producing stippled effects on prints of large dimensions usually associated with the name of Mr. Vanderweyde—an enterprising American artist, who, in conjunction with Mr. Sarony, secured a patent and introduced the process into this country. The details of the patented process were very fully given in this Journal at the time of its introduction, and we shall not here advert to them further than to say that the stippling is produced by means of a mixture of pumice powder or other abrasive substance and powdered crayon, the mixture being applied by friction with the hand. This application seemed singularly easy; and when any person stood by and watched the operation he felt more than satisfied as to his own ability to produce similar effects whenever the opportunity of trying to do so was presented. But, simple as it seemed, many on trial failed to produce effects that were at all presentable. Both artistic and mechanical skill were required to an extent not at first sight apparent, and in what follows will be found some practical hints to facilitate the application of the crayon in the desired form of a stipple.

We anticipate a remark which may be offered—to the effect that patent restrictions are interposed between the process in question and the public—by observing that in order to obtain similar results it does not at all involve a recourse to the original patented method, seeing that various other processes have been freely presented to the public for their use without any restriction whatever.

It may be a little difficult to determine which of these unpatented processes is most worthy of recommendation; for we have seen results obtained by several of them that, at least, quite equalled those produced by the mixture of pumice powder and crayon powder. We may, however, speak in high terms of commendation of two or three, commencing with a process—referred to, although not described, in our Almanac for 1874—introduced by Mr. Sarony, of Scarborough, who at the commencement of the summer of 1873 showed us several specimens admirably executed by its agency, at the same time laying before us an "opinion" he had just received from an eminent authority on patent law—Mr. Aston, Q.C.—to the effect that, as the crayon was not applied by means of pumice stone or other equivalent abrading substance, the patent which claimed the use of such substances was not infringed by the use of the mixture employed by Mr. Sarony. In obtaining this opinion—which we published about eighteen months ago—Mr. Sarony has rendered great service to those of the photographic public who declined to purchase the right of using the patented method, and yet who, from want of knowledge of patent law as applied to this particular case, might have felt dubious respecting their right to practise the method.

We have said that Mr. Vanderweyde's patent was for the application of a mixture of powdered crayon with pumice stone or other abrasive substance; the method adopted by Mr. Sarony, concerning which Mr. Aston's opinion was obtained, was the application of powdered gum arabic mixed with the necessary crayon.

A still simpler method was adopted by Mr. B. J. Edwards, who found that pulverised *conté* crayons, when applied alone, produced the desired effect without the admixture of either pumice stone or gum arabic. We have been present when specimens, which where afterwards exhibited at a meeting of the South London Photographic Society, were produced in a very brief space of time by the means described.

A long period has elapsed since powdered rosin (colophony) was suggested as a suitable agent for "diluting" the crayon when used for producing the stippled effect; and Mr. A. L. Henderson, at a meeting of the above-named Society, exhibited a picture stippled in that way many years previously. Nor must we omit mentioning a method communicated to The British Journal of Photography by Mr. G. Croughton, in which the stipple was obtained by first pressing the albumenised print in contact with a sheet of smooth glass paper and then working in the crayon by means of the finger; nor that communicated by the same gentleman to the London Photographic Society, in which the gloss is first removed from the paper by means of friction with pumice powder, which is then wiped off and the crayon applied in a similar manner.

These and other methods are at the disposal of any who choose to adopt them. But, as we have hinted, it is not sufficient that the crayon, with whatever other powder it may be diluted, be applied by friction with the hand or finger. Some fail to obtain anything beyond a smooth, smudgy effect, while others, using the same materials upon the same picture, produce a fine and even stipple. The secret lies in the manner in which the friction is applied. Let the hand be passed over the picture in large circles or sweeps, and it is probable that the smudginess spoken of will be produced in great perfection; but, on the contrary, let the hand or finger be carried over the surface in a series of circular motions of very small extent, and an effect of a different and more desirable description is obtained. Therefore, let those who have tried either of the methods above described, and have not succeeded in obtaining the desired degree of stipple, try again, adopting the exceedingly simple modification at which we have here hinted, and success will reward such attempts.

The admixture of a little wheat flour or similar white powder with the *conté* crayon, especially towards the close of the operation, gives a wonderful lighting-up effect. This, however, is not necessary when powdered gum or resin is used. Mr. Croughton recommended a mixture of two-thirds of soft to one-third of hard chalk when the surface of the print has had the albumen greyed by means of the pumice powder, as already described. This was the mixture he employed when operating before the London Photographic Society. We have just seen a charming picture finished in this manner, and on comparing it with one executed by the patented mixture of pumice and crayon we unhesitatingly give the preference to that executed by the method unrestricted by any patent.

## PLAIN PAPER PRINTING.

Prints upon plain paper, when they are not mealy and too cold in colour, are often very beautiful, and suitable both for portraiture and landscape. No one, we imagine, of refined taste would deem it an improvement to a good lithograph, or mezzotint, or line engraving

upon India paper, to coat it with a varnish. There is a depth and an atmosphere about such proofs which is incompatible with a varnish, and for this reason they are never glazed.

This being the case in respect to works of art, it is worth while to study the various methods of printing photographs in a similar style for special purposes, although we concede willingly to the admirers of proofs upon albumenised paper that, when well executed and rolled upon a hot plate in a glazing press, they are not only very beautiful also, but have the merit of greater delicacy in the details and greater transparency in the shadows. Nevertheless, it must be borne in mind that nature is not suggestive of a varnish, and that matt prints are more truthful in their general effects than varnished ones. It has sometimes been said that photographs upon albumenised paper are vulgar, and remind one of certain cheap "Brummagem" goods. However true that remark may be of prints which have only a moderate glaze it does not appear to us to apply to such as have an amount of glaze almost equal to that of glass or enamel. The vulgarity ceases when the glaze is carried to an extreme, and we congratulate professional portraitists on the means which they now adopt for giving a higher glaze and greater smoothness to the surface of their prints.

But to return to the subject of plain paper printing. There are many ways in which this may be done very satisfactorily. There are the carbon processes, collotypic printing, and a secret process of Mr. Pouncy's, which, if not actually perfected by him, was very suggestive of results exhibiting an extraordinary resemblance to aquatint engravings. There are also two methods of silver printing by which good proofs can be obtained upon plain paper, and it is to these latter processes that we will now more particularly invite the attention of the reader.

The first of these methods is one in which the print is developed by gallic acid, after a very short exposure to light. This process is still occasionally employed by some in taking enlarged proofs from small negatives by artificial light. Some years ago we used this process for printing proofs of the ordinary size by contact with the negative, and the best results at which we arrived were obtained when the nitrate bath was acidified with lemon juice instead of glacial acetic acid, and when the nitrate of silver was recrystallised, neutral, and in the highest state of purity. These two circumstances made a vast difference in the vigour and beauty of the proofs. We found that when the common acid nitrate of silver was used the proofs were invariably rusty and disagreeable in effect. We fancied—but may have been mistaken—that lemon juice was preferable to citric acid, on account of its containing a mucilage which added vigour to the print.

Developed prints have the following peculiarities:—When viewed by transmitted light they have much greater density than sun prints, so that when waxed they make more vigorous transparencies, unless the latter have been taken with a view to this particular purpose by methods which we will describe presently. They have a peculiar yellowish tint in the lights, strongly resembling that of India paper, and not the least like sulphuration. This tint is most certainly *not* due to sulphuration, because it occurs *before* the print has been put into the hyposulphite of soda bath. If, when a print is fully developed, it be suddenly viewed by a gleam of white light which has been allowed to fall upon it, the general yellowish tint which the paper has received will be plainly seen. Evidently this colouring matter must be some compound of silver, but what that may be has not yet been ascertained.

Photography has already proved the existence of many curious compounds with which chemists were not previously familiar, and which they do not seem even yet to be in any great hurry to investigate. Lastly: developed prints upon paper do not in general exhibit as much sharpness of line and delicacy of gradation as sun prints. There is a raggedness in their lines and a want of continuity in their shades which most people think objectionable in a photograph, although in particular cases it may not be inartistic. The effect is demonstrably due to the roughness of the surface of the paper, since it is not perceived at all in developed prints upon glass. Development has the property of exaggerating the contrasts between the lights and shades of an under-exposed print. Now, if we suppose the rough surface of a sheet of paper to consist of hills and valleys, the tops of the hills and the bottoms of the valleys will have been exposed enough, whilst the sides of the hills will not. This will produce in the development an exaggeration of contrast between these parts, and hence will arise a greater want of continuity or regular gradation of shade than in sun prints.

Now we come to sun printing upon plain paper—a process with which we experimented largely in the early part of last year. The difficulty here is to get the vigour of printing-ink, without the slightest glaze, or that disagreeable blueness of tint like writing-ink which is peculiar to gold toning.

We first tried paper simply salted, without any organic matter, excited upon a new nitrate bath, toned with chloride of gold and soda, and fixed with fresh hyposulphite. This gave results not at all satisfactory, being blue and mealy beyond endurance.

The next experiments consisted in adding some gelatine and orange juice to the salting solution, and it was marvellous what an improvement this made. The prints were now of a rich, warm black, without the slightest glaze, and perfectly pure in the whites. The best formula seemed to be the following, and it is easily remembered:—

| | |
|---|---|
| Chloride of sodium | 8 grains. |
| Nelson's gelatine | 8 ,, |
| Orange juice | 8 minims. |
| Water | 1 ounce. |

The solution must be used hot, and the paper must be immersed in it for a minute, and then be hung up to dry. It must be excited upon a sixty-grain nitrate bath, and be toned with the common gold toning bath. It is extremely sensitive, only requiring about five minutes to print in sunshine; and it tones very quickly and readily. The toning should be carried to the deepest possible black. The print should then be washed and fixed in rather strong, fresh hyposulphite of soda solution; after which it should be put under a tap, or under a pump, and be washed in this way by itself for about five minutes. It may then be hung up to dry. The whites will be absolutely pure, and the print probably as permanent as if it had been printed in carbon, the image being composed entirely of metallic gold incorporated with the paper. We have been greatly pleased with the results of this process, and also with its simplicity, and the great economy of time and material. The paper which seemed to give the best results was the common, thin, white scribbling paper which we buy for about seven shillings per ream, and use in writing these articles.

Sun prints upon plain paper, obtained in the manner described—or, in fact, in any other way—are sometimes improved by being brushed over with a mixture of one part of colourless almond oil to about six parts of benzoline. This deepens the blacks without conferring any glaze, or making the paper more transparent when dry, at the same time that it gives the paper a sort of India tint which, so far from being objectionable, is often an improvement.

The above treatment of a silver print of any kind has also the effect of revealing, in a very marvellous way, any impure silver deposit which may exist within the pores of the paper. It is probable, therefore, that it may be used with advantage as a test of proper fixation. We have known some silver prints which have looked quite white and innocent before the application of this test turn intensely yellow as soon as they were touched with the solution. The mode of fixing and washing a silver print which we have above described always seems to satisfy the above test, and we are, therefore, strongly inclined to believe that it is the best mode of proceeding when permanency is desired, and far better than allowing a large number of imperfectly-washed prints to lie soaking together for hours in a tub of water, according to the common practice. A print should be thoroughly washed by itself under a tap before it is put to soak with others; and then it is doubtful whether the soaking will not do it more harm than good. Be that as it may, our beautifying solution of oil and benzoline will afford a ready means of testing the efficacy of various methods of fixing and washing. The results should be compared with a piece of the plain paper similarly treated before any chemicals have been applied to it.

When a transparency is required the printing may either be carried very deep indeed, or the *back* of the paper, instead of the face which has been floated upon the nitrate bath, may be placed in contact with the negative. This will give an extremely mealy print, which will, however, exhibit great opacity in the blacks when looked *through*.

## WHAT IS THE VALUE OF A NEGATIVE?

There is, perhaps, nothing in connection with the commercial phase of photography, or with the transfer of a photographic business, about which there is more trouble than how properly to arrive at the value of the negatives which may have accumulated during the series of years the business has been in existence.

In landscape work, in which the trade is generally a publishing one, the matter is comparatively simple. There is an average demand for so many copies annually, which yields a certain amount as a clear profit on the year's transactions, and it is, of course, an easy matter, in arranging the amount to be paid for goodwill, &c., to fix on the combined income of a certain number of years as the sum to be paid as purchase money for such business. Landscape negatives of this description are sometimes undervalued on the ground that it is easy for another photographer to go to the same spot and take a duplicate; but those of our readers who may have been unfortunate enough to get a favourite negative broken know full well that it is no easy matter to repeat the operation with similar success. In point of fact, the repetition of a first-class negative is about as difficult as to duplicate a first-class engraving; and it is well known that some of the early copies of good engravings readily bring from sixty to eighty guineas, while similar copies of freshly-engraved plates of the same subject hardly bring as many shillings. Keeping this in mind, we think that the income derived from such negatives is certainly worth at least ten years' purchase. The same remark, of course, applies equally to certain negatives of public men for whom the demand is likely to continue, and which, indeed, increase in value as the person represented increases in age.

We would take this opportunity of urging on photographers who may possess negatives of value, and prints from which are likely to be wanted in large quantity, to make copies by the dusting-on process, and, to ensure permanency and freedom from injury during the operation of printing, to coat them with a suitable enamel powder and subject them to the action of the muffle furnace. In other words, to convert the somewhat delicate and easily-injured negative into a vitrified enamel which shall be practically indestructible. This, we are now in a position to say, is really a perfectly easy matter, as we have recently proved over and over again in experiments with negatives ranging from $4\frac{1}{4} \times 3\frac{1}{4}$ up to $9 \times 7$. In a future article we shall return to this subject and describe the manipulation and apparatus with which we succeeded unfailingly, in the hope that all who have to print much from valuable negatives may thereby take such precautions as will prevent injury from that cause being possible.

The value of ordinary stock portrait negatives is, however, a very different affair, and we do not wonder that referees have great difficulty in measuring out even-handed justice to both parties. By the present copyright law applicable to photographs it is abundantly clear that the photographer has no copyright in the negatives he produces on the order of a sitter, unless such copyright be invested in him by written agreement at the time of sitting or giving the commission; and, therefore, the negative is absolutely valueless unless for the production of prints to the order of the holder of the copyright. It is equally clear that the photographer is the sole owner of the *matériel* of which the negative is composed, and that he may efface it, transfer it, or otherwise dispose of it, according to his own pleasure, the receiver being, of course, bound by the same law not to use it for printing purposes without the consent of the owner of the copyright.

Keeping, then, in mind this restricted property in portrait negatives, it will be evident that they are in a very different category from those of landscapes. In forming an estimate of the value of ordinary portrait negatives three factors should, we think, be taken into account, namely, whether the sitter be young or old and the age of the negative.

In the case of young sitters the value, as a rule, should be very little, as year by year fresh negatives are more likely to be demanded than prints from old ones, while in the case of aged sitters the value is, as a rule, greater in proportion to the age. It is, in the first place, difficult to get old persons to submit themselves to the hands of the photographer, and then, as a rule, they have a more extended relative connection who may require copies of the negative than younger people. This, to begin with, brings larger orders, and on their decease the negatives frequently become of very great value.

Then the age of the negative is a matter of much importance. Of course the time at which orders for copies cease to be received varies under varying circumstances; but, after a tolerably extensive inquiry amongst photographers of all classes, we believe we may fairly assume that three years is the average limit of the period within which copies from old negatives may be expected to be required.

Acting on the opinion above expressed, then, we consider that in valuing a stock of negatives they should be divided into three classes—those over three years of age, those of young people, and those of old people. The first class of negatives we consider only worth the price of new glass, as, although it costs something to clean them, that may reasonably be expected to be met by an occasional order for prints. The second class should be valued somewhat on the principle recommended in the case of landscape work. The third class may fairly be valued at a price midway between the two.

We do not usually consider the commercial aspect of photography to fall within our province to discuss; but we have been so frequently applied to in cases of dispute, we have thought it right to give expression to our opinions on the matter.

We used to see chimneys for lamps, and globes for gas, of a fine non-actinic orange, said to be coloured with silver, but for some time they have been out of the market. We are not aware whether or not they can be made of crown glass; but, if so, it might be worth while for somebody to collect all the old negatives in the country and convert them into those very useful appliances. There is silver enough for the purpose in the films, and the organic matter would be converted into carbonic acid, and be driven off. In this way new glass might be got for old, to the mutual benefit of all concerned.

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It was announced at the meeting of the London Photographic Society, on Tuesday evening last, that from the whole body of the members only one hundred and ten voting papers had been sent in, and of these only forty were received from country members—a proof, said the speaker, of the vaunted interest said to be taken by country members in the affairs of the Society. But, in our opinion, these numbers do not accurately represent town and country. We presume that these data have been obtained from studying the post-marks on the envelopes; but that this is misleading will be evident when we take into consideration the fact that some at least, if not many, of the country members are understood to have sent their balloting papers to London there to be posted. It is even whispered that some of the country members, feeling their own want of knowledge respecting the qualifications of the respective candidates, sent their papers to friends in London for the twofold purpose of being filled up and sent in. This may tend to throw some light upon the fact that apparently only forty returns were received from the country.

## ON THE VARIOUS STYLES IN PORTRAITURE.

[A communication to the Edinburgh Photographic Society.]

In the present short paper on the above subject I will first set out by noticing the various processes and phases through which photography has passed. I do not, however, intend to dwell on them.

Photography, for so young an art, has had many and various transitions—from the metal plate in the Daguerreotype to glass in the positive, and from that to paper in the negative process to carbon tissue in the autotype, and to greasy ink in the photolithographic and heliotype—till it would be difficult to tell where its various and final ramifications will end.

Like other arts it has also had its fashions and its follies. At one time the rage was stereoscopic, at another microscopic. At another time enlargements would be the cry; at another some new dry process would absorb attention; while at a subsequent period photographers would be found chasing after some new and patented process which was to create a revolution in photography, but which would, in the course of a few weeks or months, be quietly put to bed never to lift its head again.

Photography may be separated into three divisions—chemical, artistic, and mechanical.

It is natural that in an art like photography that part of it in which it had its birth—namely, the chemical—should first engage the attention of those professing it, and until the conditions required of it in that direction were understood little progress would be made with the others.

I need not here speak of its mechanical phase, as that has kept pace with the chemical. When the chemical conditions called for mechanical arrangements they were not found wanting. I do not overstep the mark when I say that the chemical and mechanical conditions required in photography are now so thoroughly understood that they may be considered as perfect. When I say this I am very far from thinking we have reached the limits of our chemical knowledge as regards photography. Indeed, I hope not. But what I mean to convey is that the wet process, by which photography is ordinarily practised, is now so well understood that I should not regard any man who is a professional photographer as worthy of the name who would make the condition of his chemicals an excuse for bad work.

It is different, however, with the artistic division of the art, which has only of late years begun to attract the attention it deserves. It could not be expected of the early practitioners of the art that they could devote much of their attention to artistic matters when they were groping their way with chemical difficulties and bad materials—sometimes brightened up by the appearance of one good picture in a dozen of bad ones, and at other times in the depth of despair from some cause or another which was then beyond their knowledge.

In the Paris Exhibition of 1867 were exhibited some remarkable photographs. They were by a gentleman whose name has since become widely known. I refer to M. Adam-Salomon. The opinions regarding these pictures were very different. The convictions of some were to the effect that they were photographs untouched; while others maintained that a great deal of their effect was obtained from retouching; while others, again, went the length of saying that they were not photographs at all, and that their whole effect was due to working up. All, however, agreed as to their beauty, and that, whatever their success was due to, they were pictures such as had never been before produced by photography. The practical effect of the exhibition of these pictu es was to open the eyes of those interested in photography morerwidely than ever they had been before as to its capabilities, both artistic and manipulative. The result of their exhibition was also to raise up numerous imitators of M. Adam-Salomon's style, and to draw attention to the retouching of both the negative and print, to both of which the success of these pictures was no doubt partly due.

This retouching of the negative has with some photographers assumed the form of a mania, so that every picture done by them, whether good or bad, had to be retouched, and this to such an extent that not only were the photographic deficencies touched out, but others due entirely to the touching were put in, till the final result was a silly, waxified-looking picture, the effect of which could not be considered due to photography.

I do not deny that the results of retouching were sometimes what might be called pretty to look at; but when looking at any of these excessively-retouched prints it always puts me in mind of the following incident:—When I was about nine or ten years of age—now a good many years since—I was taken by a near relative of my own to see a large travelling wax-work exhibition. After having seen the whole collection—from Daniel in the lion's den, and King Solomon in all his glory, to the last celebrated murderer—to my heart's content, the question was put to me—"But do you not see that they want something?" After having in vain endeavoured to guess what it might be—seeing that the figures were not only properly but gorgeously dressed, that there was real hair on their heads and colour in their cheeks, and that some of them were actually moving—I at length asked what it might be they wanted, and got for the answer—"They want life!" Now, I never look at any excessively retouched and, it may be, beautiful pictures but the vision of the wax-work figures crops up while the thought comes into my mind — "they want life." Certainly if photography be capable of rendering a face with any degree of character or life in it, retouching, such as has been practised for years back, is just as capable of polishing it out again.

It must not be thought from what I have said that I entirely condemn retouching. Photography has its defects as to colour, and imperfectly renders some faces, as we all know. The defects I consider it perfectly legitimate to remove. What I condemn is the abuse or indiscriminate use of it, and the almost entire obliteration of all the delicate photographic detail. It is the practice of some photographers to sit for hours touching a single head, while all the touching that I would consider necessary would be to strengthen a little some of the lights, or make up any deficiency in the shadows, or entirely touch out any small defects—all of which could be done in a few minutes.

I am glad to perceive that a more healthy opinion regarding touching is beginning to spread among those who practise it most, and that those who formerly would not tolerate it at all are now putting it to its legitimate use.

I will wind up what I have to say on this point by a quotation from Sir Joshua Reynolds:—"The highest finishing is labour in vain unless, at the same time, there is pres⟨e⟩rved a breath of light and shadow." Now, retouching cannot put shadows in though it takes them out. The most it can do in this direction is to bring up the lights, which is a very different thing from putting in shadows; in fact, its whole tendency is unnaturally to flatten. My opinion of retouching, therefore, is—the less of it the better.

On one of the latest styles in photographic portraiture I will now say a few words. Though it is somewhat of a misnomer to call the pictures to which I refer "Rembrandts"—at least, in so far as they bear any resemblance to portraits by Rembrandt—I do not, however, object to the name, as they certainly bear a closer likeness to the style of Rembrandt than to that of any other painter. But the pictures which pass current as Rembrandts in photography have certainly little in common with pictures by that master. They want that beautiful, luminous softness which is most apparent in Rembrandt's works; and I have never as yet seen any attempt in a photographic "Rembrandt" to break up the black, even background on which they are usually done. This background is very different from those in Rembrandt's pictures, which, though generally painted in a very low tone, are always full of a gradation, softness, and contrast which give value and roundness to the figure. Listen while I give an extract from Fuseli:—

"None ever like Rembrandt knew how to improve an accident into a beauty or give importance to a trifle. If ever he had a master he had no followers. Holland was not made to comprehend his power. The succeeding school of colourists were content to tip the cottage, the hamlet, the boor, the ale-pot, the shambles, and the haze of winter with orient hues or the glow of setting summer suns. * * * No one combined with so much transcendent excellence so many, to all other men, unpardonable faults, and reconciled us to them. He possessed the full empire of light and shade and all the tints that float between them. He tinged his pencil with equal success in the cool of dawn, in the noonday ray, in the livid flash, in evanescent twilight, and rendered darkness visible."

Photographic portraiture in the so-called "Rembrandt" style has, however, been a valuable lesson to photographers. It has led them to study more than ever they had previously done the various styles and effects in lighting, and the different ways and conditions under which a pleasing and satisfactory result could be arrived at. If Rembrandt photography had done nothing more than this I hold that it will have done a great deal to advance photography. It is only by the careful study of lighting and posing the figure that photography can have any claims on or make any real advance into the domain of art. Still I do not think that the Rembrandt style of lighting is the ultimate object which it should be the photographer's highest ambition to achieve or master. I think it should only be a stepping-stone to lead us on in the study of lighting.

Examples of what I regard as the highest style in portraiture are to be found in the works of Reynolds, Lawrence, Gainsborough, Raeburn, Jackson, Northcote, and others. There is now on view at our Industrial Exhibition a collection of engravings from the South Kensington Museum, which is the finest collection of engraved portraits I have ever seen. They are nearly all of them splendid specimens of portraiture; but there are some of them that I can only characterise by calling them "gems." Amongst these are portraits of Sir G. Beaumont, by Hopner; the Earl of Egremont, by T. Philips; Davies Gilbert, by Howard. The last-named picture, I see, has been presented to the Museum by Dr. Diamond. There are two new beauties in the same frame, namely, the portrait of Flaxman, painted by Jackson, and that of Chantry, by Raeburn. There are also many other splendid examples of what I regard as the highest style of portraiture, the examination and careful study of which will well repay those interested in the artistic advancement of photography.

J. M. Turnbull.

## SALICYLIC ACID AS AN ANTISEPTIC.

It may be an advantage to those who are experimenting with gelatine, as well as those who require an antiseptic agent for other purposes, such as the preservation of albumen, pastes, &c., &c., to know that salicylic acid used in very small quantities preserves organic matter from decomposition of any kind. A solution of gelatine ten grains to the ounce has been now standing several weeks on my kitchen mantelpiece, sometimes fluid, always tolerably warm, yet kept perfectly unchanged by one-eighth of a grain of salicylic acid per ounce.

Salicylic acid is an extract from coal tar, and is one of the constituents of carbolic acid. It is without odour, and almost tasteless as well as non-poisonous. It is very slightly soluble in water, but more so in glycerine or oil, and produces, so far as I can see from my experiments, no chemical effect injurious to the reactions involved in photographic operations.

This acid has been known for a long time, and was extracted from the oil of wintergreen at a rate too costly for its use in any ordinary industrial process, but it is now made artificially by a process discovered by Rothe, by uniting carbonic and carbolic acids together in the presence of caustic soda, by which means it has been so reduced in price as to become available for many common uses. It is sold by Messrs. Hopkin and Williams at two or three shillings per ounce, whereas it once cost £10, and only a few months ago I paid twelve shillings.

W. J. Stillman.

## CHANGE OF THE SUN'S POSITION AT DIFFERENT SEASONS OF THE YEAR.

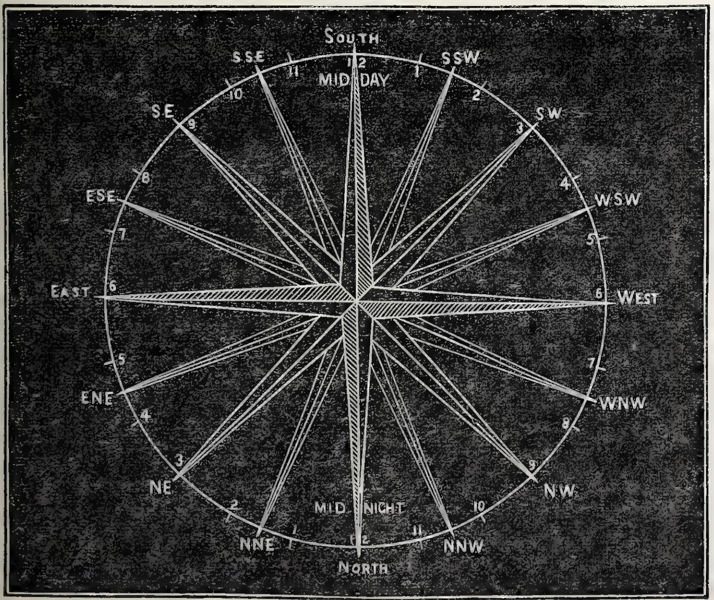
It is a universally-known fact (says Herr Jaffé, in *Photographische Correspondenz*) that, in consequence of the inclination of the earth's axis at the ecliptic, the sun sometimes stands higher and sometimes lower over the horizon. It is, however, less known that, simultaneously with this change of altitude, a variation also takes place in the sun's relative position to the points of the compass. With us, as in the whole temperate zone of the northern hemisphere, the sun's position at noon is due south; and from this one is led to assume, since the earth performs a revolution every twenty-four hours and every point upon its surface describes an entire circle, that the sun always stands in the east at six a.m., in the west at six p.m., in the south-east at nine a.m., and in the south-west at three p.m., &c.

At Vienna, on the forty-eighth degree north latitude, the following, however, is proved to be the case. The sun stands—

| | E. a.m. | S.E. a.m. | S. noon. | S.W. p.m. | W. p.m. |
|---|---|---|---|---|---|
| On the 21st December | — | 9.10 | 12 | 2.50 | — |
| „ „ 21st March and 23rd Sept. | 6.0 | 9.50 | 12 | 2.10 | 6.0 |
| „ „ 21st June | 7.10 | 10.30 | 12 | 1.30 | 4.50 |

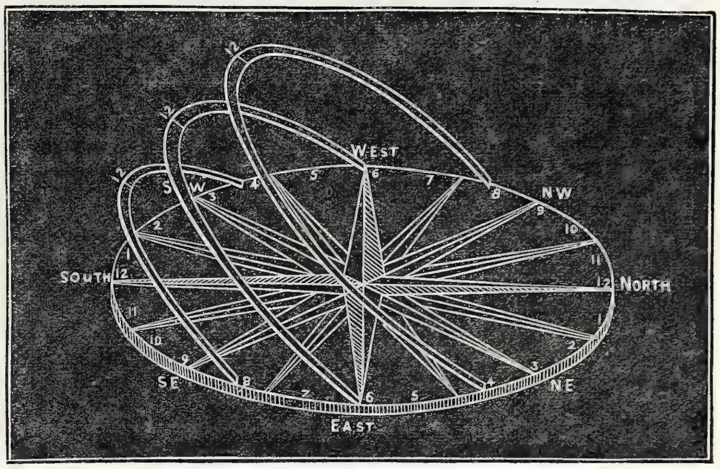
Whoever wishes to test the accuracy of this statement should proceed as follows:—Divide the circumference of a circular dial (*fig.* 1) into

FIG. I.




twenty-four equal parts, mark these divisions with the numbers of the hours, from one to twelve a.m., and from one to twelve p.m. Then draw upon it the dial face of a compass, so that the south may coincide with twelve noon. Then cut three narrow circles of the same circumference as the dial and divide and mark their outer edges with the hours in the same manner as before. Cut one of the circles off at eight a.m. and four p.m., the second at six a.m. and six p.m., and the third at four a.m. and eight p.m., and fasten the ends of all three arcs to the corresponding hours upon the dial, so that they are inclined towards the south at an angle of 42° to the dial. *Fig.* 2 is a perspective view of the finished model.

FIG. 2.




The part of the circles cut off represent the sun's orbit as it appears to us in Vienna, Munich, and all other places which lie 48° north—the first on the 21st December (the shortest day), the second on the 21st March and 23rd September (when the days and nights are equal), and the third on the 21st June (the longest day). In order to find out the sun's position at a given hour on any of these days one has only to let fall a perpendicular from the particular hour and arc to the face of the dial, and read off the name of the point of the compass on which the line falls.

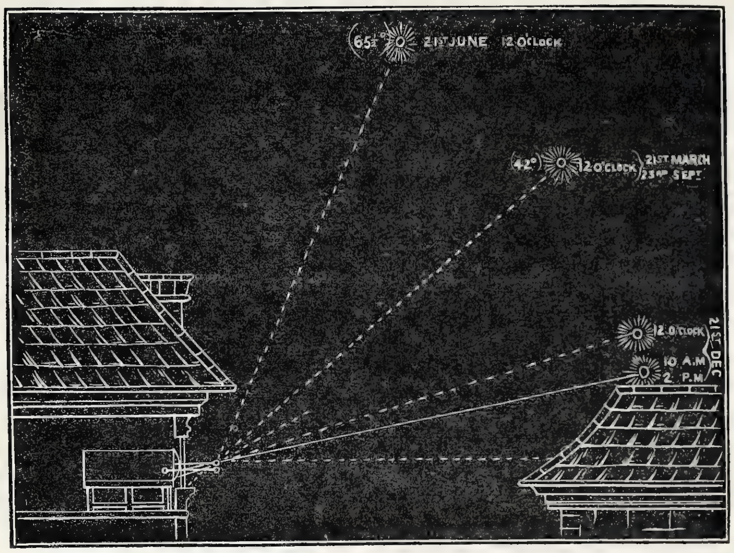
The sun's position for all the other days of the year is very easily reckoned when once the four already spoken of are found. Naturally, the construction of the model has to be changed for different degrees of latitude. The farther north the longer the longest day will be, the shorter the shortest day, and so on. Also the angle which the segments of circles must make with the dial will be altered, this angle always expressing the difference between the number of the degree of latitude and 90. For example: for St. Petersburg, on the sixtieth degree of latitude, the angle would be 30°; for Naples, Madrid, and Constantinople (41° N. lat.), it would be 49°.

Many a photographer must have wondered how it is that the same building should be touched by the sun's rays on one side in winter at a given hour of the day, and at the selfsame hour in summer it should be touched on the opposite side. To such an one the foregoing statement would be useful, if he wish to decide upon a time and site for building, by means of a compass, Bühler's helioscope, or Wehl's *Guide to Building*, since a beautiful shadow really contributes to the perfection of the picture. Indeed, by means of this model, one can always study the shadows as they would be produced by the sun's rays falling on a building favourably and definitely situated, both geographically and with reference to the points of the compass. For this purpose the model must be pretty large. Take it into a dark room and set up upon the dial the model of a building with prominent pillars, ornaments, projections, &c., taking care that the model of the building about to be observed is placed exactly on the centre of the dial, and in the desired direction of the compass. The light of a candle held to one of the arcs will show the direction in which the shadows will fall on the building on that day of the year for which the arc is specially constructed. The foregoing would also prove useful to anyone looking out for a site for a studio or an enlarging apparatus, especially the latter, since the angle formed by the arc of the 21st December and a line raised from the centre of the dial is that by which the mirror will receive unobstructed light and be struck by the sun's rays on the shortest day. With us on the 21st of December, at noon, this angle falls as low as 18½°, and at ten a.m. and two p.m. yet 5° lower, so that the sky would only be unobstructed for 13½°, and about Christmas the illuminating power of the lens is diminished below the point of utility.

It may be remarked here that for our latitude an enlarging apparatus erected on Wothly's system, with the mirror in the north, as shown in the diagram *fig.* 4, is much to be preferred to that on Monckhoven's system, with the mirror on the south; because,

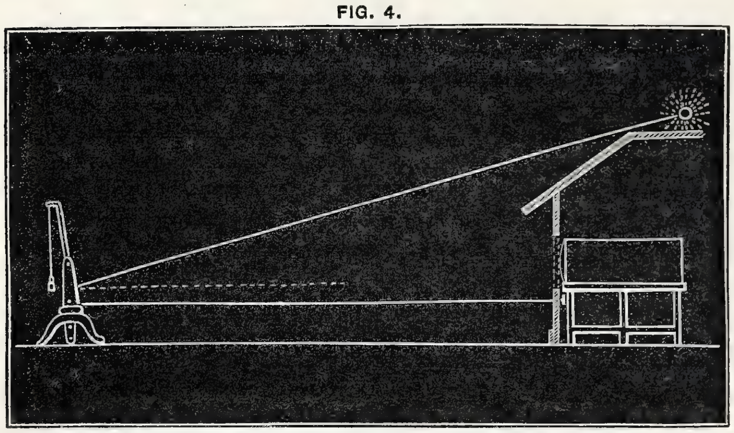
while in winter Monckhoven's mirror only gives sunlight to a small part of the lens, by Wothly's system the whole of it can be illuminated at every season of the year, as the mirror must be placed about eight times the diameter of the lens distant from it, thus

FIG. 3.




allowing the whole of its plane to receive the sun's rays even in the shortest days. Another advantage of Wothly's system consists in this—that no direct rays of the sun fall on the combination lens. With Monckhoven's mirror this is unavoidable.

FIG. 4.



In conclusion: we will only make one more remark. A single glance at our model shows that the sun's ascent from ten to twelve and its descent from twelve to two o'clock is very slight, while before ten it rises rapidly, and after two it falls as quickly to the horizon. This is, then, the reason why the light from ten to two possesses about equal power, while it increases rapidly up to ten, and from two decreases again with the same rapidity.

## NOTES ON PASSING EVENTS.*

By a Peripatetic Photographer.

The light recently introduced to the London Photographic Society by Mr. J. Spiller affords a fine theme for the display of the inventive faculties possessed in such a large degree by photographers. What is wanted is continuity, combined, of course, with steadiness; but, assuming that such continuity has been obtained, the question would arise whether this light is then equal to that of magnesium. That it will be equal to it in actinic power will not, I imagine, be asserted by anyone; but it will be immensely cheaper, for, notwithstanding all the fair promises that were at one time made by the patentees and others interested in introducing magnesium prepared by the new method, the unpleasant fact remains that it is still as expensive as at the time when such promises were made.

I question the wisdom of those late officials of the London Photographic Society who have, I learn on the best authority, been during the last few days engaged in an active canvass of both country and town members in the interests of the former President, Mr. Glaisher. Even if the canvass be successful, and that gentleman be again returned as President*, a position humiliating to one party or the other —the elected or the electors—will have been created. Bearing in mind what took place at the meeting from which he took what he then said was his *final* departure from the Society under circumstances not replete with dignity, Mr. Glaisher can scarcely with self respect accept the office if he were elected; should he *not* be elected he cannot feel grateful to those supporters who placed him in the position of being a second time rejected; while, if he be elected and decline to serve, he administers a practical rebuke to his supporters which they cannot be supposed to relish.

What is "up" with the Art Union of the Benevolent Association? Report says that at the last moment they were served with a notice that their Art Union was illegal, and its being proceeded with would be at the peril of its officers. I, and many others too, have always understood that there was a special clause in the Lottery Act exempting from its operation the distribution of works of art. It surely cannot be that photographs are not considered legally entitled to be included in the category of works of art!

The first popular meeting held in connection with the South London Photographic Society appears to have been highly successful. A note which appeared in this Journal relative to the substitution of common house gas for hydrogen prompts me to inquire if the great value of a spirit lamp as a substitute for either of those gases be adequately realised. I speak of its merits after a by no means limited acquaintance. I am not quite so sure whether carburetted hydrogen, when burned in a safety jet, is at all superior in any respect whatever to the flame of a well-constructed spirit lamp. I have seen a sixteen-feet disc *well* illuminated by the oxycalcium light, which shone with a degree of uniformity that compared favourably with any form of the oxyhydrogen light. Then, again, in places situated far away from the mains of a gas company the exhibitor has nothing to care about; *his* hydrogen is carried with him in the very convenient guise of methylated spirits of wine. The attention of photographers and lantern exhibitors ought to be directed towards the improvement of this very convenient and cheap kind of oxyhydrogen light, which permits of the use of soft lime balls and little pressure on the oxygen gas.

Fahbach or Fahrbach, or in whatever way Mr. Ceileur (not Ceileuz, as you printed it) spells his *nom de plume*, has been at last caught among the breakers. He was well known in London, where his fate does not excite any commiseration. He may congratulate himself on the limitation placed on the authority of the judge, who remarked he had no power to give him more than five years' penal servitude.

What a number of photographers have died during the past month! Among the various notices which have appeared of Mr. Rejlander's death I am not aware whether or not the cause of his death has been mentioned. It was, I understand, what is now known as "Bright's disease," being the same to which the late Mr. Flowers, a well-known photographer in the Westminster-road, fell a victim.

* Concluded from page 66.

* On referring to our report of the meeting of the London Photographic Society it will be seen that the candidature of Mr. Glaisher *has* been successful.—Eds.

## ON THE USE OF PHOTOGRAPHIC AND CHEMICAL APPARATUS.

### CHAP. X.—PREPARATION AND USE OF GASES.

Familiarity in the manipulation of gases should be gained as early as possible by the student, and the ease with which he can make and lead and store them will be in some measure a test of his general ability in chemical manipulation. In obtaining this necessary familiarity he will, at the same time, gain knowledge in the most certain way—by direct experiment—mere book learning *of itself* being entirely inefficient in making a good chemist, while many experiments with gases are of a striking nature and likely to impress upon the mind some of the leading facts in chemistry. It is not, of course, intended here to treat of all gases; to do so would require a volume of itself. The management of a few only of those most likely to be required in early experiments will be dealt with—carbonic acid, chlorine, hydrogen, sulphuretted hydrogen, and oxygen. They are produced by the admixture, in suitable receptacles, of certain chemicals which, acting upon one another, cause the gases to be evolved.

In their production the application of heat is required in some cases, while in others the mere mixture of the necessary substances suffices to generate them with rapidity, the shape and material of the generating vessel being governed by these conditions. The gas

being made it is sometimes conveyed, by means of suitable connections, direct into the liquids to be tested, sometimes dissolved in water, and sometimes stored away, by the aid of the pneumatic trough, in glass or other vessels for use when required, and in most cases it is purified by "washing," as it is termed, before any use is made of it. This paragraph will serve to indicate the order in which the various aspects of the subject will be dealt with.

For making gases where heat is not needed almost any kind of flask may be used; but, as it is generally needful to have at least two tubes passing through the cork, it is advisable to select such as have tolerably wide mouths. Retorts will be mainly used when heat is to be applied, though they can be replaced by suitably-selected flasks.

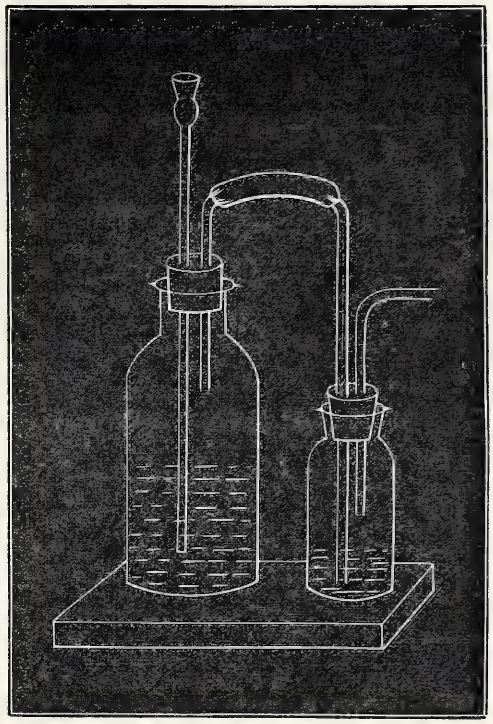
A utensil in common request in preparing gases is the Woulff's bottle—a round, glass bottle with two or three necks, and made of stout glass, either German or French. The latter are the cheaper form, and quite as useful as the former, which are shorter and wider, and have narrower necks made very even inside to admit of being accurately fitted with corks. It will, at the outset, be desirable to call attention to one circumstance in the making of gas, which, in the first to be named, is of special importance. The first portion of the gas produced will be mixed with the atmospheric air present in the generating vessel, and must for a while be allowed to escape, when pure results are required, either into the air direct or, if it be desirable to have some knowledge of the quantity evolved, into one of the receiving jars to be described. Many of the gases being of a noxious or offensive nature, and liable to injure the other contents of the laboratory, it will be essential to provide some facilities for conveying them into the external air. This may be done by connecting them with the chimney flue in the manner best adapted to the conveniences afforded by the premises. Heavy gases, such as chlorine, sulphuretted hydrogen, &c., may be conveniently carried into the drain by means of a special pipe. Large, well-found laboratories are provided with special chambers opening into the flue, so that the atmosphere of the apartment may be kept clear.

One of the most simply-prepared gases is hydrogen, the method of making all others being in principle the same, but amplified or specially adapted to meet certain conditions. It will be conveniently prepared in either a flat-bottomed flask or a common glass bottle provided with a tight and accurately-fitting cork, in which are bored two holes—one for the tube to convey the gas, the other for a funnel to be used for pouring the liquid contents through. For all gases which, like this, do not require the aid of heat in their production, the thick glass bottles are the most serviceable, from their less liability to breakage or to get overturned from being top-heavy with the fittings of tube, &c.

The exit tube should be of considerable length for convenience in leading the gas; and as a long, rigid tube is inconvenient and liable to breakage, it will be of advantage to make it in two pieces, and join them with a piece of india-rubber tubing. A really good cork, free from cracks, is not always easy to obtain; but if only a thin bung be available it may be made to answer well by attaching to it, with glue, a piece of deal or other wood of sufficient thickness and pierced with holes to correspond with those in the cork. The whole may be varnished over with red sealing-wax dissolved in spirit. This form of gas bottle is shown in the diagram, and may serve as a type for use with several gases. A two-necked Woulff's bottle is frequently used instead of this arrangement, the funnel being fitted with a cork into one neck and the exit tube into the other. It has, however, no practical advantages over the other method except that the small corks are, perhaps, less likely to become too loose-fitting in the course of time; but if the large cork be taken out and left to lie on the top of the bottle when not in use its elasticity will be preserved almost indefinitely.

To procure the hydrogen some zinc clippings are put in the flask, which is then one-third filled with water. Upon sulphuric or hydrochloric acid being poured down the funnel the gas will at once be evolved, and may be conveyed to any place by the aid of the tube. The rapidity with which the gas is formed will be governed by the amount of acid added. It is not advisable to generate it too quickly, as the effervescence is liable to cause minute quantities of the liquid to be mechanically carried over with the gas. This, however, may be remedied by passing the gas, before making use of it, through water contained in an intermediate bottle or flask, which is hence called a "washing bottle;" the various impurities are arrested by the water, and the gas passes through in a very pure form.

It is recommended that the gas generator and the wash-bottle be always kept on a block of wood or loose stand for convenience of carrying. They are so represented in the diagram. The tube conveying the gas from the generating bottle should only dip for a short distance under the surface of the water, or it would cause the fluid to rise in the funnel to an inconvenient height. The length this tube dips into the liquid added to the length the delivery tube dips into the liquid to be tested, or in the trough, will be the height the



fluid will ascend in the tube funnel. (In some cases, with other gases, several of these wash-bottles are required, and the gas passes through them in succession.) A quantity of gas equal to about twice the contents of the flasks should run to waste before collecting, as upon the application of a light when showing the inflammability of hydrogen a dangerous explosion would result if this precaution were not attended to. The absence of air will be readily ascertained by filling a small test tube over water in the manner to be explained and applying a light. If air be absent the gas will burn at the mouth of the tube without explosion.

G. Watmough Webster, F.C.S.

*(To be continued.)*

## FOREIGN NOTES AND NEWS.

Ventilation of the Dark Room.—Troubles of the French Artists near Fontainebleau: MM. Millet and Melbye.—Millett's Paintings and Sketches.—Photographic Society of France: Meeting of the 8th Ult.: Theory of Vibrations: Astral Photography.—Photographic Society of Berlin.—Baron des Granges on Apparatus for Landscape Photography.—Glycerine Coating for Plates.—Cleansing of Distilled Water.

Whatever relates to sanitary matters is now receiving much attention at the hands of every educated man who values his health; and a great deal has been said already about the ventilation of the dark room, both in French and English photographic journals. An operator who remains boxed up there for hours at a stretch, with only the door opened now and then, is certain to suffer in his health, not merely from the fumes of the various chemicals, but from the poisonous carbonic acid gas which he himself manufactures in his lungs, and exchanges, at the rate of many gallons per hour, for the pure oxygen of the air.

In connection with this subject a curious analysis has been recently made by a Russian *savant*, Dr. Hubner, of the vitiated atmosphere of the Maria Theatre, St. Petersburgh, during a performance. The experiment was made in one of the second-tier boxes facing the stage. Every quarter of an hour the temperature rose, and the increased accumulation of carbonic acid gas and moisture in the air became very perceptible, until towards the close of the performance the air was so vitiated as to become absolutely poisonous, producing fatigue, headache, thirst, &c. Now, imagine the fumes of ether, acetic acid, ammonia, cyanide of potassium, &c., added to this, and some idea will be got of the nature of the atmosphere, during summer, of a small, unventilated dark room in which an operator

has spent several hours at a stretch, coating, exciting, and developing collodion plates. In a theatre, although crowded with persons, we must remember that there is the lighted chandelier with the open space above it acting as a splendid ventilator, at the same time that the numerous open doors and passages are continually admitting fresh air; but in a photographer's unventilated dark room there are no such chances, and therefore the comparison seems to be even in favour of the theatre, with its most objectionable results on health, leaving out of account the poisonous fumes of the photographic chemicals.

The very first condition of the dark room should be perfect ventilation. A similar remark will also apply with considerable force to a sleeping apartment. In short, the effects of civilisation on health are very curious, and the death rate is hardly an accurate test of the health of a population; for whilst many of our foolish habits tend to shorten life, medical science enables us to prolong an unhealthy life by a treatment which to some extent combats disease and arrests the uplifted arm of death. Is photography a healthy pursuit? Yes, if properly conducted; otherwise, a very unhealthy one.

The neighbourhood of the forests of Fontainebleau, where so many French artists, mostly landscape painters, reside, and amongst them Rosa Bonheur, has been lately infested by a band of brigands, who have added murder to their other crimes. Strangely enough they seem to have a leader who has an appreciation and a knowledge of art, judging by the discrimination sometimes shown in their selection of the things stolen. Whilst mentioning the deplorable fact of the existence of such a band in such a spot, and with such proclivities and victims, it occurs to us to add that the late M. Millet, one of the most celebrated of modern French landscape painters for the refinement and sentiment shown in his works, resided in this neighbourhood, where he led almost the humble life of a peasant. And this again reminds us of another loss which France has just sustained in the death of the celebrated marine painter, a Dane by birth, Professor Melbye, which occurred in Paris on January 10th. He was first a ship-carpenter, then a musician, and, lastly, a painter. He resided many years in Paris, and was patronised first by Louis Philippe and afterwards by Napoleon III. For a few months also, during a stay in Constantinople, he was patronised by the Sultan. It is said that he would have had the honour of giving lessons in drawing to the Empress Eugenie if he had not three times broken his appointment with her.

Poor Millet—by some critics esteemed as the greatest of French landscape painters, not excepting Claude, Poussin, and Rousseau—appears to have died in poverty, leaving a widow and nine children, with nothing but some unfinished paintings and a portfolio of sketches for their inheritance! Might not photographs of these, printed in carbon, be a help to this poor family, for they would assuredly have great interest for artists and connoisseurs? M. Braun and MM. Goupil will, perhaps, have already turned this over in their mind; but, if not, there may be a chance for some enterprising English firm to take our hint, for their own advantage no less than for that of others.

The Photographic Society of France held its usual monthly meeting on the 8th ultimo, and the proceedings on that occasion have just been published in its *Bulletin.*

A communication was read from M. Floridor Dumas, expressing his belief that all natural phenomena, including, of course, those of photography, are due to vibrations in one single ethereal medium; but unfortunately this belief has not led the learned gentleman as yet to any useful practical results. His experiments have been interrupted in consequence of his having been promoted to the dignity of "*chef d'escadron d'état major.*"

M. Geymet exhibited a series of proofs which were intended for the *Bulletin*, in printing-ink, from a negative of the tower of Bar, at Dijon, by M. Audebort.

The *Bulletin* contains the substance of a long lecture, by M. C. Worf, on astral photography and the observations of the transit of Venus. We shall have more to say about this matter next week.

At a recent meeting of the Photographic Society of Berlin a letter was read from Baron des Granges, who has lately been taking views in Greece, in which he gives some details as to his tent, lens, &c. He says:—I am more convinced than ever that the new wide-angle aplanatic lens is most useful for landscape and architectural subjects; it takes up so little room, and with it one can reach corners that were completely inaccessible with the old aplanatic. A picture should not have less than 60° of angle, else it gives the impression of being but a piece cut out of a larger one. Unfortunately, the new wide-angle lenses are not yet in the market. The travelling gear used in these journeys has stood the test well and is easy to set up. It consists of two chests of equal size and weight, placed one on each side of a mule and the tent, which is laid flat on the top of the boxes. One box holds the camera, cloth, envelope, &c.; the other contains the silver bath and chemicals. The front of this last chest folds down and forms a table, being supported by a folding tripod. On the side being folded down a flat box containing the silver bath may be removed and placed at once in the tent; the bottles may then be reached. The upper back portion of the chest is occupied by a water-tight cistern with a waste pipe, and in the under "back wall," so to speak, of the box is a window. The tent looks like that of Rouch, only lighter, and not so complicated. I cannot warn photographers who wish to take large plates too strongly against porcelain dipping baths. In the course of my journeys I have lost three of them, as well as the silver solution they contained, and that in spite of their being covered with felt and laid in a mahogany box, that, again, being packed in another box covered with horsehair. These misfortunes made me fall back on the plan of a cardboard bath and lid covered with caoutchouc. My collodion is iodised with—

| | |
|---|---|
| Iodide of cadmium | 2 parts. |
| Bromide of cadmium | 1 part. |
| Iodide of potassium | 1 „ |

After three years it has proved quite useful and sensitive. It works singularly well until it has been at least four months iodised, and brings out more detail in the shadows than any other I have tried.

After the reading of Baron des Granges' letter a discussion, begun at a former meeting, as to the best preliminary coating for plates was resumed. Herr Pflüger, of Cüstrin, wrote that he had tried ammonia, as recommended by Professor Vogel, and found it answer the purpose; but he cleaned the plates so prepared with one or two drops of glycerine, according to the size of the plates, and then kept them in a temperature of from eight to ten degrees. He says such plates keep clean eight or ten days, and are better than plates prepared with either albumen or caoutchouc. He also recommends that dusters kept for cleaning the glass be boiled in soap and soda, and that the plates be kept in piles and not in boxes. A member suggested that the glycerine would be apt to take on dust. Another said he had had good results with caoutchouc, while another extolled gutta-percha, as being more easily dissolved; but no decision as to the respective merits of the different materials was arrived at.

Herr Pflüger further called attention to the white and cloudy appearance which nitrate of silver dissolved in distilled water sometimes has. To clear it he adds two or three drops of permanganate of potash, and one and a-half or two drops of nitric acid. The water immediately clears, and in twenty-four hours a brown deposit will be left at the bottom and the solution may be filtered off. It was then remarked that the milkiness of the silver solution in water could only be caused by metallic chlorides or carbonic or sulphuric acid salts, and that the addition of manganese to clear it was purposeless, since the latter only acts on organic substances which often found their way into distilled water. Thereafter followed another discussion on mounts and their chemical effects on the prints, but no remarks were made calling for particular notice.

# Meetings of Societies.

## LONDON PHOTOGRAPHIC SOCIETY.

THE annual meeting of this Society was held on Tuesday evening last, the 9th instant,—Mr. J. Spiller, F.C.S., President, in the chair.

Messrs. W. D. Bosanquet and M. P. Tench were elected members.

The CHAIRMAN read the report of the Council, which, as he explained, extended back only for the nine months they had held office.

The report was adopted unanimously on the motion of Mr. Bedford, seconded by Mr. Spencer.

Mr. J. WERGE directed attention to what he considered an offensive circular that had been sent to several members, to the effect that voting papers for the election of officers and council would not be sent to members unless they previously forwarded their subscriptions; and, further, that certain initials and marks, in no two cases alike, had been put upon the balloting papers, rendering it easy to tell by inspecting the paper which member it was who filled it up. This he considered was contrary to the principle of the ballot.

The SECRETARY explained that the circular spoken of contained only an extract from a special law of the Society having reference to the case, and that it was his duty to send it to those members who had not paid their subscriptions. The marks on the back of the papers were

his own initials, and any dissimilarity was easily accounted for by the difficulty of writing three initials absolutely alike.

Mr. W. J. Stillman observed that as the Secretary had not had an opportunity of seeing any of the papers between their being opened and destroyed, it was evident that he could not possibly be aware of the way in which any member had voted, no matter even if he had marked any papers with that intent.

Mr. T. Sebastian Davis, the Treasurer, took upon himself the responsibility of having advised the sending out of the circular referred to, and said he had himself furnished the copy of the law bearing on the subject to the Secretary, to be printed.

The Treasurer's report was then submitted by Mr. Davis, showing a balance in the bank of £261 1s. 6d.

This report was adopted, and a vote of thanks awarded to Mr. Davis for the attention he had bestowed upon the financial duties entrusted to him.

A brief conversation followed respecting the Society's exhibitions in their paying aspect. Mr. Hooper thought that they might be made to pay all the expenses incurred in connection with them; while Mr. F. Howard considered that, even if the exhibitions proved to be greater sources of loss than they were, the funds of the Society could not be spent in a more useful way.

*Election of Officers.*—Mr. Stillman, as senior member of the scrutineers appointed to open the balloting papers, reported that they had just completed their scrutiny, and that the following gentlemen were elected:—*President:* Mr. James Glaisher.—*Vice-Presidents:* Messrs. John Spiller, Valentine Blanchard, and Captain Abney.—*Council:* Sir Charles Wheatstone, Professor Stokes, Major Malcolm, and Messrs. England, Bedford, Pritchard, Bird, Dallmeyer, Davis, Friswell, Fry, Woodbury, Swan, Hughes, Stillman, Howard, Mayall, and Mayland.—*Treasurer:* Mr. R. W. Thomas.

The Chairman said that they would all welcome Mr. Glaisher back again; and as for himself, whether he served the Society as first or second officer, he would have pleasure in doing his duty in whatever sphere he might be called to act. He owed an apology to Colonel Stuart Wortley for having put him in nomination for president without his consent, and he had been reminded by Colonel Wortley that in this he had done a foolish action towards himself, seeing that those who had voted for Colonel Wortley as president would otherwise have been recorded in his (Mr. Spiller's) favour, on the principle that when two liberals were entered to compete with one conservative the conservative was sure to win. He wsa quite aware of the truth of this; but it had been represented to him that it would be invidious in him standing alone as opposed to Mr. Glaisher, and hence at the last moment he had proposed the name of Colonel Wortley without consulting him, in order that there should be a third person nominated.

Votes of thanks were then accorded to the retiring officers, the scrutineers, and the auditors, and, after the adoption of a verbal alteration in one of the laws, it was intimated that the next meeting would be made special in order to take into consideration the alteration of one of the laws relating to the payment of subscriptions as applied to voting.

At the close of the meeting Mr. York exhibited a number of negatives of the transit of Venus, taken at Capetown.

The meeting was then adjourned.

## PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

The ordinary monthly meeting of the Board of Management was held at 174, Fleet-street, on Wednesday, the 3rd inst.,—Mr. J. Skinner in the chair.

The minutes of a previous meeting having been read and confirmed, Messrs. Steele, Lane, F. Stoddard, F. Dighton, Banks, Patterson, and Miss Jones were duly admitted members of the Association.

The Secretary was instructed to convey the thanks of the Board of Management to those ladies and gentlemen who so kindly and efficiently contributed to the success of the annual general meeting on the 11th ult.

The Secretary read an application from a member for relief, and, after a discussion and hearing the evidence of the members signing the application, the sum of £5 was voted for the purpose.

The application of another member to take him to work was next considered, and after the reading of letters from his referees (which were of an unsatisfactory character) a sum of money was ordered to be sent to a photographer in the neighbourhood, who would take the ticket for the applicant's journey.

The Secretary was instructed to get a card of membership printed.

After the transaction of some routine business the meeting was adjourned.

## EDINBURGH PHOTOGRAPHIC SOCIETY.

An ordinary meeting of this Society was held at 5, St. Andrew-square, on the evening of Wednesday, the 3rd inst.,—Dr. Thomson, the President, in the chair.

The minutes of the previous meeting were read and approved, and Messrs. James J. Fulton, Alexander Porteous, and W. Hannah were admitted as ordinary members.

The Chairman laid on the table an album containing a large collection of pictures by the late Mr. O. G. Rejlander, kindly lent by Mr. Constable, and a fine collection of mounted prints by the same artist, lent by Mr. Elliot. He said that before proceeding to the ordinary business of the evening he thought it necessary, briefly, to allude to the loss which the whole photographic world had sustained by the death of Oscar Gustav Rejlander, which had taken place since they last met. He had not the honour of a personal acquaintance with Mr. Rejlander, but from the testimony of those who knew him best he was certain that his acquaintance was one of which any man might have been proud. For the talent, industry, and perseverance of their lamented friend he had, in common with all who valued art, the highest admiration; and he was sure that he only echoed the feelings of the meeting when he said that in him photography had lost one of its brightest ornaments and art one of its truest sons. Mr. Rejlander, it would be remembered, was one of the earliest pioneers in the effort to show what photography was capable of doing, and one of the first to raise it from being merely mechanical and place it side by side with, as a not unworthy sister to, painting. His services were given just at the time when they were most required. Ordinary photographic manipulation was so simple, and it was so easy to produce some kind of image on the collodion film, that men of all classes rushed into the ranks of photographic "artists," most of them with no art education, and many with no education at all. The work of many of those men degraded photography to such an extent that even at the present day it had not quite recovered from the shock. Sitters, as a rule, have sufficient vanity not to like to see themselves represented as worse-looking than they really are; and this was just what, at one time, the art was caused to make them to be. At this crisis Mr. Rejlander and some others came to the rescue, and by patient, persevering industry, guided by art knowledge and art education, showed to what high flights photography was capable of attaining, and how pliant it could be when handled by men of refined taste. Mr. Rejlander was a most industrious man, and had left behind him a large collection of valuable works, of which those on the table were excellent examples. He would recommend photographers to study them carefully, as he was sure they would get much benefit therefrom.

Mr. James Ross, in response to a request made by the Chairman, said:—I feel confident that all present will agree with me when I say that the lamented death of O. G. Rejlander has left a vacant space in the ranks of photography which few, if any, are able to fill; indeed, I have never met with any photographer who did not willingly bear testimony to the artistic excellence of his pictures. We can all tell a "Rejlander" at a glance—not from any particular mode of lighting or style of background, but from the impress of the artist's own genius, which is more or less stamped upon them all. My own admiration of his works has all along been so sincere and so ardent that, somehow, I have remained entirely blind to his alleged defects as a manipulator. There are a few gentlemen now present who had the pleasure of meeting Mr. Rejlander at a supper party given in his honour some years ago, and who may remember that the late Mr. Clark—himself a master in manipulation—in the course of a highly-eulogistic speech, made the remark that Rejlander was a far better manipulator than his friends gave him credit for. This was the simple truth; for it must never be forgotten that many of his subjects precluded the hope or chance of perfect manipulation. For instance: a negative of a boy walking on his hands alongside a London omnibus could hardly be expected to develope so smoothly and equally as a negative taken of a gentleman sitting comfortably in a photographer's chair, supported by an iron pillar, where the necessary time can always be given; and to those who say that nothing should be done by photography except what can be done to perfection, I have only to reply that such an idea, if acted upon, would stop all progress, and, in the opinion of many, the art of photography in every shape would have to be abandoned. Besides, is the fond mother's heart not to be gladdened by a true representation of her baby's very pleasant although very evanescent smile, merely because the background may not be quite so speckless or spotless as it should be? And have we not before us, amongst these portraits of ladies and gentlemen, ample evidence that although Rejlander invariably aimed at something higher than fine manipulation, nevertheless, in the mere mechanical part of our art, he was "a workman that needed not to be ashamed?" Probably you have all seen the biographical sketches which have appeared in the journals, as well as the letter in the *Scotsman* by his kind friend and generous patron, Mr. Constable. The writers all bear witness to his undoubted genius as an artist, as well as to his very genial and loving nature as a man. Mr. Constable has kindly sent me several letters written by Mr. Rejlander upon his death-bed. Very, very touching are these. There is one likewise from Mrs. Rejlander, containing an account of her husband's funeral, the expenses of which, I fear, will leave but a small balance at her banker's. A few friends, however, in Edinburgh are endeavouring to dispose of Prince Albert's picture by subscription, for the purpose of helping the widow in her affliction, which is really the true and proper way to honour the memory of our departed friend and brother, O. G. Rejlander.

Mr. W. Neilson said:—It has been often said that photography cannot attain to the position of a fine art, as the photographer can only reproduce what he sees. Well, that is in one sense true, and the works of any particular photographer will be works of art or not just in proportion to the little or much artistic feeling they possess. The photographer with a true knowledge of art will conceive the picture in his brain, train and manipulate his model to be what he has so conceived,

and then make his camera reproduce the conception. This was the way Rejlander set about his work, and the result—those magnificent pictures on the table—was beyond all praise. If they were not art then he was sorry for art, and had no doubt that some of those who talked most learnedly about art might learn much from Rejlander's works, especially of his wonderful command of light and shadow and effective simplicity of composition. Rejlander trusted little to upholstery and less to retouching, and without either had managed to leave to the world a legacy of art photographs that would be appreciated as long as there were men and women in it of cultivated taste.

Dr. Hunter (late Superintendent of the School of Design in Madras) said that he had got a greater treat in the examination of Rejlander's photographs than ever he had before. There were four or five on the table that might fairly rank with the finest work of any of the old masters in all good art qualities. Mr. Rejlander had evidently looked into the minds of his sitters, and even managed to bend them to the direction in which he wanted them to be, and so had in all his pictures not merely given a faithful likeness, but also made the composition such that there was a story to tell and much that was suggestive. He had also studiously kept himself out of view, and so had given rise to the continuous variety which was so characteristic of the whole of his work.

Mr. Norman Macbeth said that he did not anticipate such a treat as the examination of the pictures on the table had been. He had met Mr. Rejlander in London, and could heartily endorse all that had been said of his winning ways and kindly, genial disposition. He was courted by men of all ranks, and nowhere was he more at home than in the society of men of the highest art-fame. No one could be in his company for many minutes without feeling that he was in the presence of an artist in the truest sense of the term. Photography has before it a wonderful future if photographers would only educate themselves as Rejlander had done. He had set before himself an ideal, to which he had worked up, and that with such success that some of the compositions could not have been better treated by even the best of the old masters. Photography in portraiture could only rise to art when the photographer brought a thorough knowledge of art to bear on his treatment of his model. This Rejlander had done in a way which was worthy of all honour, and which was the result of patient study.

Mr. A. Mackay wished to corroborate all that had been said in favour of Rejlander and his works. It amply proved the truth of his remarks, in his paper read at the last meeting of the Society, when he urged photographers who wished to be more than mechanics to study in our picture galleries. Rejlander had done this to some purpose, as his works bore ample evidence. He was, indeed, a true artist, and so produced works in every sense artistic.

Dr. John Nicol moved that it be remitted to a committee to prepare a minute expressive of the sense of the loss the members generally felt in the death of Mr. Rejlander, and that a copy should be sent to his widow.

Mr. Turnbull then read a paper *On the Various Styles in Portraiture.* [See page 75.]

Mr. Ross entirely agreed with Mr. Turnbull in objecting to retouching. He was glad to see, however, that the practice was gradually being abandoned, or, at least, those who hitherto had done most in this way were finding out that it would be better to do less. A really good negative did not need it, and operators should strive rather to make perfect negatives than trust to get their omissions partly cured by the art of the retoucher.

Mr. A. Mackay thought Mr. Turnbull's paper written in a capital spirit. If photographers generally would only aim at educating themselves, and then make the camera obey their wishes, there would be little need for retouching, and photography would go on with rapid strides to perfection. Mr. Rejlander owed nothing to retouching, and yet his work was such as to make even the best envy him.

Mr. W. Neilson had listened with pleasure to Mr. Turnbull's paper. He had no objection to retouching so long as the public insisted on it; but he thought the public ought also to be educated to appreciate what was truly good, and when that happy result was attained the pencil would be discarded, and the art of retouching become a thing of the past.

Mr. Asher said it was well known that shadows in photographs were generally darker than in nature. The old masters, to whom allusion had so often been made, always took care to throw a little light into their shadows, and he thought retouching to that extent was fairly allowable. It might also be legitimate to use it in softening the hard lines, so long as the true texture was not hidden.

Mr. Norman Macbeth did not like to appear severe, but he regarded the practice of retouching as beyond condemnation. He would strongly press on the attention of photographers the importance of a more careful study of development. In that, he was certain, lay the secret of getting a true transcript of the finest effects of nature. Over-development and retouching were equally destructive of that fleshy texture which ought to be the charm of a good photograph. They produced the appearance of marble rather than of flesh. It was much better to have a faint indication of freckles than to produce the marblelike appearance which is always a result of retouching. As a proof that retouching was not necessary he called attention to one of Rejlander's portraits, which had evidently been printed from a thin negative, and which showed most marvellously the texture of the skin and the anatomy of the face. Another serious objection to retouching, he stated, lay in the fact that after death the portrait painter was often required to paint a picture from a photograph, and that a good result from such a print was simply impossible.

Mr. Ross hoped they would all lay to heart what Mr. Macbeth had said. He once got a picture from Rome; it was the first retouched specimen he had seen, and he wished it had been the last. It had no bones, no muscle, no nothing, in fact, that a picture ought to have, and gave rather the idea that the model had been a mass of plastic putty, manipulated by a clumsy hand.

The usual distribution of prints was then made by ballot, and

Dr. Nicol (the Corresponding Secretary) intimated that he had received from Messrs. D. H. Cussons and Co., of Southport, a number of their little almanacs, and as there was not sufficient to supply all the members present he should give one to each of those who had drawn a blank, and he might say that as each almanac contained two pretty photographs they would have reason to be well pleased.

Votes of thanks were then given to Mr. Constable, Mr. Elliot, and Mr. Turnbull, and the meeting was adjourned.

# Correspondence.

Meeting of the Photographic Society of France.—Presentation of Almanac and Proofs by Professor Stebbing.—Novel Mode of Detaching Collodion from a Plate.—Carbon Proofs.—Heliochromy.—Enlargements.—A New Invention.—M. Chardon.—M. Riche and the Sulphur-Oxygen Light.—A Light for the Dark Room.

The monthly meeting of the Photographic Society of France was held on Friday evening last, the 5th inst. The chair was taken by M. Aimé Girard. After the presentation of new members and the reading of correspondence I was called upon by the Chairman to make the presentation of The British Journal Photographic Almanac for 1875.

The Secretary, M. Perrot de Chaumeux, in a few suitable words, spoke eulogistically of the publication, pointed out the services it had rendered during many years to photographic science, &c., and finished by thanking the Editor and Publisher for their gift to the Society.

I then laid before the Society a number of very fine proofs in fatty inks which had been forwarded to me by Mr. A. Findlow, of Warwick. These proofs were examined with great attention by the members, who were unanimous in acknowledging that great progress had been made in that branch. The Chairman tendered the thanks of the Society to Mr. Findlow for the presentation.

M. Fortier gave a description of a very easy manner of detaching a collodion film from its glass support without the aid of an acid. He described it as follows:—After cleaning thoroughly the plate, and before the collodion is poured on, take a little talc and rub it over the plate. Pour on the collodion, and when the negative is finished pour over it a solution of gelatine of the strength of twenty per cent.; when this is dry cut the edge all round with a sharp knife, and the negative will easily peel off from the plate without further trouble. At a time when so much carbon printing is done this process may prove of great value, and render much service by its simplicity.

M. Franck de Villechole presented some carbon proofs for the inspection of the members. They were made, he said, from paper prepared by the Autotype Company. The positives on paper were certainly very remarkable—due in a great measure to the artistic taste of M. Franck; but those on glass, intended to be hung up in parlour windows, would have been much better had another tint been used instead of the sepia red, which, looked at as a transparency, imparts a disagreeable impression to the eye.

M. Lacan then presented to the Society several heliochromic proofs from M. Leon Vidal, and read a very long communication from that gentleman. Has the heliochromic process of M. Leon Vidal really become a practical as well as a commercial process? This question was often repeated during the evening. As to being practical it appears to be so, for the proofs laid before the Society were far superior to those I had previously seen. Great credit is due to M. Vidal for the praiseworthy efforts with which he strives to improve his process; and it is only justice to say that every new batch of proofs is far better than the preceding one. Is it a good process in a commercial point of view? What is the desideratum sought? Rapidity of production and cheapness of product. M. Vidal says that this difficulty *has* been overcome, and places before us a photograph of a steam-engine 5 × 7 very well tinted, and which can be sold (if I mistake not) at the low price of 2½d. I believe, sooner or later, something will come out of all this. M.

Vidal is a gentleman with a "hobby," but it is a good one; and he is, above all, resolute and persevering. When I had the pleasure of making his acquaintance at Paris I found him full of the *feu sacré*—the stuff with which nature has *not* endowed the mass of mankind.

M. Despaquis presented the Society with a very fine enlargement (made by his process) direct from a *carte de visite* without any retouching whatever. M. Despaquis interposes (in the camera) between the lens and the plate to be exposed a sheet of glass on which he dusts some very fine emery. This powder, he says, sifts, as it were, the light and destroys or counteracts the reproduction of the grain of the paper. The retouching can also be done on the glass. M. Despaquis further informed the members that he had perfected Poitevin's process, by which he could in a rapid and continuous manner print photographic proofs in fatty inks by steam power. My manner of working (said he) will permit a printer to print from a single gelatine film as many proofs as, and even more than, can be printed from a lithographic stone, with all the purity of the half-tones and with all the truthfulness of silver prints. By a new system of damping the film the employment of a sponge and drying rollers is done away with, and the thousandth proof, printed from the same film, without stopping, will have the high lights and the half-tones as pure as the first. This process (he continued) is at once simple, practical and easy in the manipulation, and is now in full working order in Paris.

M. Chardon then made a communication to the Society on the value of permanganate of potash for the multiplication of negatives or positives.

The business of the meeting concluded by a lecture on the sulphur-oxygen light by M. Riche, which was heard with great attention. I need not dwell on this, as I had the honour of giving the first account of this light to the readers of The British Journal of Photography, and of which new subscribers will find the full report at page 57 of the Journal.

During the festive season of Christmas what numbers of things are done to amuse children! These amusements are not always looked upon disdainfully by even grown-up persons, such as snap-apple, and plums thrown into hot rum, into which, when set fire to, all the young urchins plunge their hands with great delight, making the house echo again and again with their joyous laughter, causing sometimes a perceptible cloud of seriousness to pass over the face of one of the oldest of the party whom the gout prevents from taking part in the youthful merriment—one who has now but memories of his juvenile days left, and at the recollection of which he smiles while he sighs, and sighs while he smiles. At this moment—no doubt influenced by the fugitive flame of the burning rum—an idea rushes into the head of one of the company, who goes out, procures a small piece of wadding, dips it into alcohol, and rubs into it a little common salt, and, as soon as the flickering flames from the snap-dragon dies out, he sets fire to his composition, when, lo! a cry of horror and terror is heard, for the whole party presents a ghastly and unearthly appearance. A reader may now ask—"What is Mr. Stebbing driving at?" It is that this fearful and ghastly light can be made use of for photographic purposes. It gives an excellent light for the dark room when developing plates, whether they be wet or dry. We have heard so much lately on the photogenic merits of such and such an artificial light that a change on that subject may be beneficial. Here is a light with no photogenic power whatever, or at least very little, for one of my dry plates was exposed to its action at a distance of six inches for two hours without receiving an impression.

If any of the readers of The British Journal of Photography who have gas in their houses would like to lighten their dark room let them take a Bunsen burner—that is to say, a burner in which common air is consumed with the gas, giving very little light but much heat. At about half-an-inch over the opening must be suspended a sort of basket or cradle made of fine wire (platinum is the best); into this small wire basket must be placed now and then a little common salt; the flame from the burner going through this undergoes a change which renders it fit to be employed in the dark room.

A very novel invention has been for a short time a subject of conversation in Paris. It appears that a Frenchman has discovered and patented a means of taking from glass and crystal its brittleness. I was informed yesterday by a gentlemen worthy of belief that he himself saw the inventor throw down a common lamp-glass or chimney and a drinking-glass without either being broke. I cannot comment or give any opinion on this invention; I only offer the news to my readers as a passing note.

I thank my brother—the "Peripatetic Photographer"—on the other side of the Channel for the friendly shake of the hand which he has tendered to me from happy old England, and can easily forgive him if he differ from me in any "unimportant point," as he calls it, in his very interesting *Notes*. But, at the same time, I must say in my own defence that, if he had paid the attention that we suppose a disciple of Aristotle ought to have done before forming an opinion, he would have easily perceived by the diagram No. 2, page 11, that the long tube of which he has such a legitimate horror was absent, and that if I did not call attention to it I had two reasons for not doing so—1. I shall be obliged to describe it in my next article on that subject; 2. I might have imagined that it was not necessary to put *des points sur les i* for the readers of The British Journal of Photography. As to the flagellation which he covets, the only punishment which I award him is—when he comes to Paris to be received fraternally by E. Stebbing, *Prof.*

*Paris, February* 9, 1875.

## THE SCIOPTICON AND TURNBULL LAMPS.

*To the* Editors.

Gentlemen,—After your intelligent readers have been asked to believe that a light placed in a short, black, iron tube has its intensity "*more than doubled*" in the direction of its ends, I think it hardly worth while troubling them with any remarks in reply to the lengthy communication called forth by my statements regarding the Turnbull light. What I stated in my former communication I am willing to prove, and from further experiments made I can show that, so far from being one-third brighter than the sciopticon light, the three-wick lamp gives less than two-thirds the light of the former, independent of its great unsteadiness.

I do not think, myself, the Rumford method the most "unreliable," except where lights of far different powers are being tested; then the difference in some of the shadow and also the colour renders a comparison difficult to institute. For testing two lights of anything approaching equal powers I believe it to be the best test, notwithstanding that Mr. Turnbull calls your readers' attention to his paper on the subject—I suppose to prove what he says. With this test, good or bad, then, I obtained these results:—At the distance of a foot from a white-papered screen a ruler was held upright. At seven feet ten inches from the screen was placed the three-wick lamp, and at ten feet seven inches the sciopticon light. Result on the paper screen: two shadows of equal intensity, the one from the sciopticon being noticeably of a redder hue than the other. Now, by squaring these distances we find the two lights represented as follows:—

Triple-wick lamp.................................. 1
Sciopticon ,, ................................ $1\frac{9}{11}$

The only reflections which could play any part were the piece of flat glass fitting the end of the tube in the sciopticon, and the back of the semicircular lamp glass in the three-wick—an advantage, if any, to the latter. As for any aid being got from the inside of a rusty tube, that is simply nonsense.

The experiments I have here detailed can be shown over and over again to anyone interested, and I think that, instead of occupying your valuable space, the best plan would be to let the matter be thoroughly tested by competent and disinterested persons—such "tall talk" as that in the last paragraph in your correspondent's letter being neither conclusive or scientific.

In conclusion: I would inform Mr. Turnbull of what he seems to be unaware, viz., that the sciopticon is the invention of Mr. L. Marcy, of Philadelphia, who has devoted his whole time to its perfection for many years. When in the States some three years ago I first saw it, and thinking it something much wanted in this country determined to introduce it. Hence my connection with it.—I am, yours, &c.,

*Greenhithe, February* 8, 1875. W. B. Woodbury.

*To the* Editors.

Gentlemen,—Having been much interested in the correspondence respecting the merits of the "Turnbull lamp," I feel it to be my duty to send you my opinion upon it.

During the last two years I have used the sciopticon with increasing satisfaction. I find the maker does not claim too much for it. A fortnight ago I was present at a trial between the sciopticon and the Turnbull lamp. The lantern in which the latter was used was fitted with a four-inch condenser and short-focus portrait lens in front, precisely similar to the sciopticon. But, notwithstanding the greatest care in adjusting the "Turnbull," the best light which could be obtained from it was *decidedly* inferior to the sciopticon.

I should not trouble you with these remarks, but I certainly think Mr. Turnbull is, to say the least, mistaken in his estimate of the two lamps.—I am, yours, &c., Henry Cooper.

*Northampton, February* 8, 1875.

*To the* Editors.

Gentlemen,—Looking at it from a literary point of view, Mr. Turnbull's letter in your last has several advantages. Its sentences are curt, its affirmations positive, its contradictions flat, and it is, moreover, pervaded throughout by an active-volcano style differing agreeably from the dull and flabby diction of many photographic writers.

Coming down, however, from the ethereal heights of declamation to the solid ground of facts, Mr. Turnbull's lamp is either equal to, better than, or inferior to, the lamp of the sciopticon. Would it not be better to submit the not very difficult question of the "candle power" of these lamps to the experiment of some uninterested third person? If both gentlemen will send a lamp to me and accept my arbitration in the matter I will undertake to give numerical values which I can defend against all comers. I may premise in Mr. Turnbull's favour that, all else being the same, one would expect three wicks to give half as good a light again as two; and I may premise against his photometric method that no lenses whatever should be used, but flame, and flame alone, should be compared together.

Finally: I may remark that the opinion that a gas flame is doubled in intensity by placing "any opaque body that is at hand" on either side is an illusion, and not a fact.—I am, yours. &c., D. Winstanley.

*The Doctor's Cottage, Blackpool, February* 8, 1875.

## EXHIBITION OF THE LONDON PHOTOGRAPHIC SOCIETY.

*To the* Editors.

Gentlemen,—There was one statement made from the chair at the annual meeting of the Photographic Society, touching the recent exhibition, which was not, I think, rendered very clear. When Mr. Hooper was deploring the cost to the Society of the last exhibition, the Chairman interrupted him with the remark that it had not cost the Society so much as the previous one; for, whereas £98 was expended in 1874, as much as £128 (I believe these were the exact sums) was spent in 1873.

This statement was true enough, so far as it goes, but it was scarcely a business-like way of viewing matters; for, although in 1873 as much as £128 was expended, the Society received in return £130 from admissions, sale of catalogues, and advertisements. Thus, in 1873 the Society was actually benefited to the extent of a pound or two by its exhibition; whereas last year a loss of about forty pounds resulted to the Society from its exhibition.

It was a pity, I think, that the Chairman did not make this clear to the meeting, especially after he had taken the matter out of Mr. Hooper's hands.—I am, yours, &c., H. Baden Pritchard.

*February* 10, 1875.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

R. Holgate.—Thanks.

J. G. E.—If the lens have the requisite means of being focussed the rigid camera will answer quite well.

D. Craig.—The smooth effect is obtained by the use of a hot burnisher, as described by us in a recent article.

Rev. T. F. Hardwich.—Such an article would be esteemed. The other information will be sent in a private letter.

Country Amateur.—Let the focus of the lens be from ten to twelve inches. For the pair of stereo. lenses let the focus be six inches.

W. N. Malley.—There are several shilling manuals devoted to the subject of painting, but no serial work of the kind required is in existence.

J. H. Ellerbeck.—Rain water will answer quite as well as distilled water. Such, at any rate, has been our experience with the process referred to.

J. F. W.—Varnish the transparencies by all means. You will, we presume, make them on the smooth side of the glass, keeping the ground side to the outside.

W. D. H.—In order to obtain such a strong solution of gallic acid as you require dissolve it in alcohol, in which it is very soluble, and then add this to the water.

Horatio Ross.—Our correspondent encloses a *carte* picture of a deer, taken in a deer forest on a dry plate. With a wet plate it would have been difficult to obtain such a picture.

J. W.—1. The information concerning Mr. Stillman's emulsion will be found in a paragraph elsewhere.—2. Write to the maker of the lens; we are unable to give the desired particulars.

Old Hand.—The nitrate of magnesium formed by the decomposition of the iodide is removed from the paper by the washing it undergoes, and hence cannot play the part you imagine.

J. J. B.—1. The Dry-Plate Club is not now in existence.—2. Do not waste time in doctoring such a very old bath, but precipitate the silver and redissolve it. This will terminate all your bath troubles.

Medicus.—The tube of the portrait combination is too short. We cannot from the description you furnish say to what extent it should be lengthened, but imagine that it will bear an extension of an inch with great advantage.

J. R.—Of the two processes named, and for such large plates as you require, the collodio-albumen is the better one. The iodides may, with great advantage, be largely superseded by bromide, that of ammonium being very suitable.

P. J. Scott.—In respect of manipulation your pictures are not at all bad; but the positions of the sitters indicate great constraint, as if you first planted the head-rest very firmly and then twisted about and arranged the sitter to suit the head-rest.

E. Cowper.—1. Concerning the fogging you had better write to the maker of the plates. We have never found them to fog in the manner described. You probably use too much ammonia or too little bromide.—2. Commence with the coffee process.

J. Carbutt.—Thanks for enclosure.

Astor.—The symptoms described indicate acidity of the ether.

W. Weston.—Will you kindly give us more definite information respecting the process about which you write? Also state the page of the Almanac where the process is to be found, and we shall then be in a position to say whether or not it is patented.

A Modern Athenian.—The scaling-off of the collodion is caused by over-iodising. The remedy in the present instance will consist in adding a quantity of plain collodion to the iodised stock, the exact quantity being ascertained by one or two trials.

W. L. Brear.—The address is 10a, Great Portland-street, corner of Castle-street. The book respecting which inquiry is made is not published in this country, and we are not aware of its price. Several other works of a similar kind are published in England.

Subscriber (Littleboro').—1. If by "two side lights" you mean the placing of a window at each side of the studio you must only use one of them at a time.—2. Make the windows ten feet long by six feet high.—3. Let the windows approach to within eighteen inches or two feet of the floor.

F. M. (Paris).—The changing-box must be very badly constructed ere it spoils the plate by exposing it to light during the act of transferring it from the slide to the box. We possess one, to and from which we have frequently transferred plates, possessing very great sensitiveness, in full sunlight, and we never knew of one of these plates sustaining any injury whatever. If you institute a close examination, or, better still, send the box and slide to any competent camera-maker in London, the disturbing cause will soon be discovered. The changing-box being an English invention, and a speciality of home makers, it is probable that French camera-makers may not be quite able to cope with the niceties of construction required, and we say this without implying general inability to these *artistes*.

Received.—F. A.; Morten Day; E. S.; Zeta; James Greenwood. In our next.

Stillman's Emulsion.—In reply to several queries we have received concerning the emulsion introduced by Mr. Stillman, to which reference was made in "Our Editorial Table" last week, we beg to state that it is supplied by the Liverpool Dry-Plate Company, at prices which will be found at page xli. of the advertising pages of our Almanac.

The Sciopticon Lamp.—In our leading article on lamps last week we have made Canon Beechey to say that the steadiness of the *sciopticon* lamp would probably be secured by the adoption of a wider chimney. Instead of the "sciopticon" read the "*triple-wick*" lamp, which was the one that elicited the remark in question. There is no flickering or unsteadiness with the sciopticon lamp.

Fire in a Photographic Studio at Bradford.—Shortly after one o'clock on Sunday morning, the 31st ult., a fire of an alarming character broke out in the shop of Mr. George Rushforth, picture dealer and photographer, Ivegate. The shop is a wooden structure, situated at the juncture of Ivegate and Tyrrel-street. As it is near the police station a number of policemen were quickly on the spot, and the firemen arrived not many minutes afterwards. In a very few minutes the fire was subdued. It had broken out amongst the pictures and other articles in the shop; the building fortunately did not ignite. Considerable damage was done to Mr. Rushforth's goods by the flames and water. Mr. Rushforth has no idea how the fire originated, as there was no fire in the shop, and the gas was securely turned off before closing on Saturday night. The insurance will partially cover the loss.

The Photographer and Artist: Piercey *v.* Holroyde.—At the Westminster County Court, on Monday last, an action was brought under the following circumstances:—The plaintiff, described as an artist, said he was employed by the defendant to make an enlarged picture of a faded daguerreotype for an agreed sum of three guineas; that on the 13th December last the defendant gave him the faded daguerreotype to reproduce on a larger scale. He removed the corrosion from the plate, and, by a process known as "Pierceytype," produced the picture which formed the subject of this action, but which, when finished, the defendant refused to accept. In cross-examination by Mr. H. T. Roberts, solicitor for the defendant, the plaintiff stated that it was a correct enlargement and could not be better reproduced. The portrait was rendered younger purposely, as photographs usually made the originals older-looking than they really were. Mr. George Piercey, the plaintiff's son, proved calling on the defendant, who said he would have nothing whatever to do with the picture, as he had been engaged in photography for five years, and asserted that there was no photography whatever in the reproduction. Mr. Eyres, an artist, stated that, although the picture looked more juvenile than the original, it could, if the defendant liked, be easily altered. The defendant stated that he objected to the portrait; but, if the plaintiff would alter it, he would willingly pay for it. The learned Judge, at this stage of the case, said he really could not see any defence to the action, and considered the reproduction a very creditable one. Judgment entered for the plaintiff, whose costs were allowed.

## CONTENTS.

# THE BRITISH JOURNAL OF PHOTOGRAPHY.

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## THE *RENAISSANCE* OF STEREOSCOPIC TRANSPARENCIES.

That such a *renaissance* is desirable there can be but one opinion, and that the progress of events points to such a consummation is also, we believe, a matter which leaves little room for doubt. We hail with pleasure the attempt made by Mr. Frank Howard to bring this question before the photographic societies, and we propose to devote a portion of our space this week in supplementing the remarks made by Mr. Howard on the subject in the paper read before the recent meeting of the South London Photographic Society, and which will be found in another page.

Stereoscopic transparencies have hitherto been divided into two great departments—collodion and albumen. We have just produced two transparencies from the same negative, one of them being by the Ferrier albumen process (which, in our estimation, is the best of the numerous modifications of the original albumen methods), and the other by the best collodion process of which we are aware—one in which it is sought to bring the character of the blacks to approximate as nearly as possible to the condition of being a stain rather than an agglomeration of large, opaque atoms. We shall not here refer in detail to either of these processes, but restrict ourselves at present to the remark that, while to our own taste the Ferrier albumen picture is the finer of the two, the collodion one is very little, if at all, behind it as respects the richness of its purplish-brown tones, although inferior as regards the transparency of its shadows. In both processes the expense is nearly on a par, and the amount of labour, degree of technical skill, and expenditure of time not necessarily greater in one than the other. On the exquisite charm possessed by a really fine transparency it is unnecessary to dwell—every photographer with an educated taste at once recognises it; and if the charges made for this class of work were not so high there is not one in a hundred who would not be the possessor of many such art-treasures.

We have said that these transparencies have hitherto been separated into two classes. The enormous power conferred by the Woodburytype process of printing transparencies with mechanical certainty, with any tone that may be determined upon, with absolute transparence in the shadows, and with all the permanence that is required, renders this a process calculated to revolutionise the expense of transparencies; for the chief item in the cost of their production are the plates of glass upon which they are printed, and these, unlike those used in any other transparency printing process, must be quite flat. This process, however, can with advantage only be utilised for this purpose when large numbers of one particular subject are required. For amateur, or even professional, photographers who may not require more than one or two dozen slides of one subject the process would be too costly; and for this class we recommend the collodion or albumen process.

The method of backing stereoscopic transparencies with ground glass so commonly employed is exceedingly offensive. Numerous suggestions have been made from time to time, and various substitutes proposed, in order to obviate this eyesore. A fine transparency, when mounted in contact with a plate of ground glass, at once loses, in consequence, very much of its beauty, and almost all its delicacy. This is a matter upon which we can speak with absolute certainty, having bestowed a considerable portion of time in dissecting a fine collection of Ferrier's transparencies mounted in the objectionable manner to which we have referred, and after a careful inspection of these works when remounted in the way we are about to recommend. Before describing this method we shall indicate the objections to the system of backing with ground glass so persistently adopted by our most eminent artists in transparencies.

When a picture mounted in this way is directed towards the light, and viewed, as it is always intended to be, through the magnifying eyepieces of the stereoscope, the granularity of the ground surface of the glass backing becomes so painfully apparent as to obliterate the finer details in the picture. But this is not all; for the whites of the transparency are perceptibly frosted all over, conveying in the most vivid manner the idea of such portions of these transcripts from nature being overspread with miniature hailstones. Still this is not all, for a picture so mounted can only be viewed when it is held up directly against the window or other source of light; if it be turned slightly either to one side or the other it ceases to become visible. Such are the charges we bring against the use of the time-honoured ground glass in this connection.

If it be said that what we have stated applies to the full extent only to coarsely-prepared ground glass, we reply that, in a tentative course of experiments just concluded, we have made use both of the glass sent out by Ferrier and other makers attached to their slides, and also of the very finest ground glass procurable in London. We have placed what is probably the finest transparency in our collection—Stuart's *View of Edinburgh from the Calton Hill*—in contact, alternately, with finely-ground glass, with flashed opal, and with two kinds of fictitious opal which we shall presently describe, with the following results:—With the first of these there was a glare of light when the line of vision lay directly towards the window; the picture being examined through a four and a-half inch achromatic lens, as eyepiece, the whites were granulated and frosty. In consequence of this granulation the finer details of the distant Castle and of the houses situated in the west end of Princes-street were nearly obliterated, and when the picture was turned a few degrees away from the light it could scarcely be seen at all. An opal backing was now substituted for the ground glass, with this result—that the whites entirely lost the snowy appearance they presented under the previous arrangement, the most delicate details of the buildings alluded to were rendered beautifully distinct, and last, although certainly not least, the picture could be examined quite well when it had been turned nearly eighty degrees from the window or other source of light. We need not here go into the optical principle involved in the superior diffusion of the radiation of light through opal as compared with ground glass; what we are concerned with at present is the simple fact stated.

But it may be said that opal glass is a very expensive commodity to be employed in the backing of stereoscopic transparencies, especially when several dozens of these pictures have to be mounted. We unhesitatingly answer—"Yes, it is so;" but add that an admirable

and perfect substitute for opal glass, and which, for the purpose in question, will yield the finest result capable of being attained, may be prepared by each photographer for himself, at a cost of two or three pence per dozen in excess of the price of plain glass; and, in reality, the effects obtained with Stuart's transparency of Edinburgh when mounted with opal glass were got to a slightly improved extent when using what we have designated "fictitious opal," and which may be made by one or other of the following methods:—

To plain and rather thick collodion add some finely-sifted carbonate of lead (white lead) in the proportion of a teaspoonful to four ounces of the collodion. Incorporate well together by trituration or shaking, then add a few drops of castor oil and as much Canadian balsam as would fill the half of a walnut shell. Filter through muslin, if necessary. This emulsion when poured upon glass will give a very fine and even opal surface; and glass thus prepared will, for the purpose under consideration, answer just as well as the finest and most expensive opal glass, whether flashed or "pot metal."

Another opal mixture—and one which, although we have not used it for so long a period as that just described, we like equally well if not rather better—is that described by Mr. Howard at a meeting of the South London Photographic Society several months ago, and which consists simply of a mixture of collodion and negative varnish. Every reader knows the effect produced by applying a lac varnish to cold glass. It dries with a matt or granulated surface something like ground glass, for which it often answers as a substitute. But altogether unlike such appearance is that produced by a mixture of collodion and varnish. Although very pure and transparent when in the bottle, no sooner has a film been formed upon a cold plate of glass and allowed to become dry than the transparence gives way to a pure translucent white, presenting a very beautiful appearance. With regard to the proportions in which the collodion and varnish should be mixed we are at present unable to say much, as varnishes differ greatly in their composition and strength; but the mixture by means of which we made our finest specimens was composed in the proportion of an ounce of ordinary collodion to two drachms of a "retouching" varnish we had made of sandarac dissolved in alcohol.

Let those of our readers who desire to examine and exhibit their transparencies under the most favourable circumstances at once remove the ground glass from them, supplying its place with a plain piece of glass rendered opaline by one or other of the methods described, and they will have every reason to be satisfied.

## SOME EXPERIMENTS IN THE PRACTICAL APPLICATION OF THE OXYSULPHUR LIGHT.

An artificial light of considerable actinic power, and at a moderate cost, has long been a desideratum; and many experiments have been made with a view to its discovery.

Moule's patent photogene—in which a mixture of nitre, sulphur, &c., was burnt—was probably the first attempt which gave anything like a practical result. It was introduced mainly with a view to portraiture during the dark evenings, but the sudden flash of brilliant light was, of course, utterly destructive to expression; while the troublesome nature of the products of combustion, and the difficulty of getting rid of them, prevented it ever coming into anything like general use. In fact, we do not suppose that, except perhaps by the inventor, it was ever regarded as anything else than something which, by advertising, might bring a little notoriety and increase an ordinary business. That it did this in one case at least we know, as we were in the habit of frequently visiting the studio of a genius who made it pay handsomely without ever making an exposure. He resided in a locality densely populated with working people who had not, or believed they had not, time to sit during the day, but who, in consequence of his advertisement—"Photographs at night better than anything that can be taken during the day"—came to his studio in large numbers. The place was arranged with a view to theatrical effect, and he went through the pretence of posing and adjusting with the greatest possible care. A flash of light from a teaspoonful of the composition—and the affair was over. No attempt at the pretence of development was made, his sitters being generally in blissful ignorance of the necessity for anything of the kind. The operation always concluded with an intimation that the least touch of daylight was often required to give the necessary brilliance to the eyes, and that if they would kindly favour him with a call the first time they were passing that touch would be given, and the shilling positive could be carried off in triumph—a "speaking likeness." Of course the second sitting was always agreed to, and so the thing was completed. Occasionally, of course, the "artist" had a somewhat trying ordeal to go through when the figure that had the night before been photographed in the after-labour coat appeared in his shirt sleeves. However, our friend, as we have already said, was a "genius," and a true genius can do anything. He really found little difficulty in proving to the satisfaction of all concerned that the coat had come off in the washing!

The oxyhydrogen light has done much good service in the production of enlargements, or wherever a small quantity of light only was required; but its actinic power is feeble, and its management somewhat troublesome.

The electric light has been used commercially on a rather extensive scale, and for many purposes it has been found of much value; but its expense is a serious drawback to its introduction unless in very extensive establishments.

The light emitted during the rapid oxidation of metallic magnesium has hitherto, undoubtedly, been the most successful and most largely used, both for enlarging purposes and for direct photography. That it may be used successfully in the former everybody knows; and all who have seen the photographs of the Kentucky caverns, and especially Professor Smyth's interiors of the Great Pyramid, can bear testimony to its suitability, in certain circumstances at least, to the latter. Magnesium, however, is still much too high in price, and is likely to remain so, to permit its being largely used; and therefore we hail with pleasure the introduction of anything that will do the work as well, and at a nominal cost. This, we think, will be found in the oxysulphur light recently introduced by Mr. J. Spiller, and, somewhat curiously, almost simultaneously brought before photographers in Paris.

In repeating Mr. Spiller's experiments we fused the nitre in a small porcelain crucible—first, over a spirit lamp; but this did not apparently give sufficient heat to raise it to the required temperature. A Bunsen burner, however, answered the purpose admirably, and, on dropping into the fused salt a few pieces of sulphur weighing about ten grains each, we got a series of brilliant flashes of a bluish-purple, which lasted for a few seconds after each addition. In their paper, read before the Photographic Society of France, MM. Riche and Bardy gave a comparison between the oxysulphur and several other lights which is certainly not borne out by our experiments; but comparing one light with another is always unsatisfactory unless there be some definite, known standard, which in their experiments is altogether wanting. Still there can be no doubt that the new light is very actinic, as we printed a series of transparencies on collodio-bromide plates from pretty dense negatives by exposures of certainly less than a second. This is only what might be expected from an examination of the spectrum, which is similar to that of the solar spectrum, but with the blue and violet extending to a considerable extent beyond the solar limit in both directions. A curious fact we noted, which must have been caused by some accidental impurity, viz., the presence, most markedly, of the sodium line.

The fluctuating light produced by the addition of piece after piece of sulphur, although all that is required for instantaneous printing, is unsatisfactory when lenses come into play; nor is the stream of oxygen thrown on burning sulphur, as recommended by MM. Riche and Bardy, altogether what we would like. With a view, therefore, to try and discover some better method we have recently spent several evenings in arranging apparatus in various ways, and the result we now present to our readers, in the hope that some one will take the matter up and bring out a really perfect light that shall be thoroughly safe, easily managed, cost little, and be strongly actinic.

We had a small sheet-iron retort of the usual conical form made to order sometime ago for experiments with oxygen. The delivery tube of this we loosely plugged to act as a safety-valve, if necessary, and in the lid we drilled a hole and screwed four inches of quarter-inch brass tube. Through a hole in the side of this was inserted a piece of much smaller tube, closed by hammering the end, and having the closing pierced by a fine hole. By this arrangement we had the larger tube in communication with the interior of the retort and in the centre of that tube, and, rising a little higher than the level of its mouth, a smaller tube coming out at the side and long enough to enable a rubber tube to be attached—an arrangement, in fact, very much like the ordinary form of "blow-through" oxyhydrogen burner. A quantity of sulphur was placed in the retort, and sufficient heat applied to raise the temperature to about 400° C.—the point at which it vaporises. The only doubt we had as to the success of the arrangement was the difficulty of properly regulating the temperature; but this was found to be easily managed by the moving up or down of the source of heat—an ordinary rose Bunsen burner. The end of the smaller tube was attached to the oxygen bag—one containing four cubic feet—and a fourteen-pound weight applied, which was found amply sufficient. When the vapour of sulphur, made its appearance the oxygen was turned on, and the result was a steady flame of about two inches in length, and of such intensity that, although we had not an opportunity then of trying it, we are sure a small statuette could have been photographed by it in a few seconds.

With chlorate of potash, at eighteen-pence per pound, we calculated that such a light could be maintained at considerably less than a shilling an hour—a rate sufficiently cheap to make it available for a large number of purposes in connection with photography.

The product of combustion—sulphurous acid—may easily be got rid of if there be in the room a suitable chimney; but, even without that, there is no difficulty in rendering it so harmless that the operation may be carried on in a drawing-room. There being no convenient chimney in the room where our experiments were made we suspended over the flame a glass funnel attached to a glass tube bent twice at right angles. The other leg of the tube was passed into one of the necks of a large Woulff's bottle, down to the bottom. The bottle was about two-thirds full of a strong solution of ordinary carbonate of soda. Into the other neck of the bottle a similarly-bent tube was inserted; but it only just passed through the cork, and its other end was connected with an aspirator—a piece of apparatus, as most of our readers know, consisting of a large bottle or other vessel having an opening at the top into which the tube through which air is to be drawn can be fixed, and a tap at the bottom from which the water with which the vessel is filled runs out. It will be evident from this arrangement that, when the light is burning, if the tap of the aspirator be opened the water will run out and its place be supplied by air drawn in at the mouth of the funnel. This air, carrying with it all the sulphurous acid, will pass into the solution of soda, when the acid and soda will unite to form the neutral sodium sulphite—a perfectly harmless compound. We may add that those of an economical turn of mind may in this way bring good out of evil, as the neutral sulphite thus produced merely requires to be digested with sulphur for a few days when it will be converted into the ever useful hyposulphite.

## ON EMULSIONS.

Photography, like most other arts and sciences, has made but small way since it has arrived at an advanced stage. The fact reminds one of steam navigation. A vessel going at six knots an hour may, with a very little extra consumption of fuel, be made to go at seven; but when going at twelve she will require to burn a vast deal more coal to get another knot out of her. The difficulty of introducing real, substantial, practical improvements in photography and photographic appliances has now become very great; and the case is strictly parallel to that of chemistry, mathematics, astronomy, and other sciences. There are some people, indeed, who hold the opinion that the *fine* arts, in all their branches—architecture, sculpture, painting, music, poetry, fiction—are now on the decline, having already passed through their meridian. There are others, again, who assert that photography is in the same plight; and that we have now given up all attempts at improvement in the taking of negatives, and are resigning ourselves hopelessly to the use of the brush and the lead pencil as a remedy for the defects of our processes. But in reply to these latter croakers we can happily point to an improvement made last year in the negative process, so far at least as amateurs are concerned. We allude, of course, to the making of collodio-bromide and gelatino-bromide emulsions.

A few words, then, on this important subject—important, because it may give quite a fresh start to amateur landscape photography, and, also, because it is worth while to consider its practical bearing on the operations of professional portraitists.

Experiments in the making of emulsions, as a means of doing without a nitrate bath, were first commenced in real earnest about a dozen years ago, when M. Alexis Gaudin published his results in *La Lumiere*, obtained by means of collodio-iodide and collodio-chloride of silver, and when Captain Dixon took out a patent in this country for a collodio-iodide emulsion. Neither of these processes, however, has turned out well. The failure of the collodio-iodide emulsion seems to have arisen from the fact that whilst free nitrate of silver is necessary in order to render the iodide sufficiently sensitive for photographic purposes, the two salts cannot remain long in contact after the whole of the soluble iodide has been converted without combining to form the mischievous iodo-nitrate of silver. Attention has, therefore, been turned to that more promising emulsion, collodio-bromide of silver. Here it has been found that the film is perfectly structureless, and that good results can be obtained with tolerable certainty when the emulsion is a slow worker and does not contain free nitrate of silver, which is not subsequently washed out of the film. A very rapid emulsion has also been introduced in which gelatine takes the place of collodion, and in this way extremely sensitive dry plates can be prepared.

We have already shown, in our recent articles *On Hobbies*, how collodio-bromide may be made serviceable to an amateur. We will now discuss the bearing which the emulsion processes generally seem likely to have on the practice of professional portraitists. Is it worth while for these gentlemen to turn their attention to emulsions or not?

In the first place, we must observe that emulsions seem to have a radical and incurable defect, viz., the liability to specks in the film. In their ordinary practice photographers are especially careful never to shake their collodion pouring bottle, and thus disturb the sediment which has sunk to the bottom, and which consists mainly of particles that have been unavoidably introduced into the collodion from the surface of the plates which have been successively coated with it. Many photographers even use a pouring bottle composed of two parts, the upper one having a small hole in the bottom, which communicates with the other, and through which the particles can fall into the outer vessel. But nothing of this sort can be employed with an emulsion. That must be shaken up violently a few minutes before it is used, and thus the particles which are unavoidably held in suspension are transferred to the film. It may be said, perhaps, in reply to this objection that the emulsion can be filtered; but a photographer in large practice would find that a much more troublesome affair than filtering and occasionally sunning his nitrate bath.

The next objection to collodion emulsions for portraiture is their comparative slowness, unless prepared by methods which are either exceedingly uncertain in their results or a trade secret. It appears to be a fact that the sensitiveness of an emulsion depends upon the excess of soluble bromide which it contains. If this be large the emulsion is slow; but if small, very rapid. Unfortunately, however, the density of the negative depends upon this excess, the slow emulsion giving good printing density, and the rapid emulsion giving, as a rule, a negative which is feeble and difficult to intensify. It has been shown that an emulsion film is homogeneous through its entire thickness, and therefore that we must either have slowness combined with density, or rapidity with feebleness. This does not appear to be the case with a film of bromide of silver that has been

excited in a bath, because there may remain some unconverted bromide of cadmium at the *back* of such a film, however perfectly it may have been converted at the *front*. Thus with a bath film we may not only have the most exalted sensitiveness from the state of the silver bromide at the *surface*, but also good printing density from the state of the silver bromide at the *back*.

But it may be said that active organic matter will act in the same way as restraining soluble bromide, and that, consequently, a gelatino-bromide emulsion will give both sensitiveness and density. Admitting, for the sake of argument, the truth of this, it will remain for professionals to consider whether this kind of emulsion may suit their purpose better than the common wet collodion process which they now employ. The objections to it will be, we think, the liability to specks in the film, and the inconvenience arising from the slow drying of the film, and its liability to contract dust in drying. It must be obvious that a liability to specks will be a fatal objection to any process by which a professional photographer has to gain his living.

Specks are of less importance in the landscape work of an amateur. Here we criticise rather the amount of taste displayed in the choice of subject, the artistic management of the light and shade, the point of view, &c., than the perfection of the manipulation. A speck or two may be allowed to pass in an amateur's landscape which would be fatal upon the face of a sitter in a professional photographer's studio; and this is why we have made no allusion to the liability to specks which an emulsion possesses in recommending this mode of working to amateurs from the many great practical advantages it possesses. There is no inconsistency in recommending an emulsion to an amateur, but, at the same time, pointing out candidly to a professional photographer the disadvantges it may have for *him*. Nevertheless, our opinions may be erroneous, and we sincerely hope they are so. We shall be glad to hear from any old emulsion worker what his experience has been on the subject of specks, and also of density in relation to sensitiveness.

The emulsion process is to many a novelty, and an interesting one. There are not many novelties just now on the *tapis* in the taking of negatives, and we must be thankful for this one and discuss its merits fairly. We invite a discussion of it in these columns. We are all interested in hearing of and reading about novelties in our art, although we may not all introduce them at once into our practice, or even care to experiment with them.

## THE LAMBERTYPE PROCESS OF RETOUCHING.

Our readers are already familiar with the name of Lambert in connection with a certain method of finishing enlargements; but of the details of that method or process they have not yet been made aware. These we are now in a position to give, as the specification—for M. Lambert has patented his invention—has just been published.

The patentee starts with the assumption that hitherto, in retouching, it has been usual to operate either on the positive print or on the varnished film of the collodion negative; and, moreover, that, when such enlargement has been produced from a paper print or rather, from a *carte* the grain of the paper shows very coarsely in the enlargement. He says, truly enough, that retouching, under such circumstances, can only be performed by experienced artists. By the method now to be described the patentee believes that all this is greatly simplified.

We give the details of the invention in M. Lambert's own language:—

"A negative of large dimensions is obtained with salts of silver, or in carbon with salts of chromium in the ordinary manner now in use. If I proceed by enlarging, the enlargement may be obtained directly from a small positive image on paper, or from a transparent positive on glass obtained from the small negative, either in salts of silver or, which is preferable, in salts of chromium specially prepared for the purpose.

"The large negative may be produced in an ordinary enlarging camera of large dimensions; but I prefer the dark room for the purpose, as it permits of overlooking the picture and making any modifications deemed desirable, as will hereafter appear. The large negative, after having been properly exposed, developed, fixed, and finished, is covered on both sides with a sheet of thin paper specially prepared for the purpose with paraffine, and subjected to great pressure, somewhat resembling bank post paper, and known in France as '*papier minéral*,' or any other semi-transparent material capable of receiving the colouring matter to be afterwards employed. I, however, prefer this specially-prepared paper of a particular grain known as '*papier pelure végétal*,' because it has the effect, when placed on either side of the negative, of neutralising by its optical combination the defects due to the material of which it is composed, and which, seen separately, exhibits an exceedingly coarse grain. This novel application will in a great measure attenuate the grain which is always apparent in photographic reproductions from images on paper. It is upon these two surfaces which cover and enclose the negative that the retouching of the picture may be effected in an extremely simple and easy manner, by applying, wherever necessary, either on the collodion side or on the other side, an impalpable galvano-plastic powder or other finely-divided substance answering the same purpose. This powder is most conveniently applied with a stump. By this means a negative wanting in vigour or harmony may in a few moments be strengthened and have imparted to it all the softness and the effect of the most carefully stumped drawing. Moreover, the effects of light and shade may be modified, the most perfect degree of softness and an incomparable finish imparted to the picture, so that any subsequent retouching of the positive paper print is dispensed with, the sharpness of the lines being restored with the aid of a blacklead pencil. This treatment may be performed in a few minutes even upon very large surfaces and by persons completely inexperienced in the art of retouching and of drawing. The negative, after being thus treated, is placed in the printing-frame with a sheet of ordinary sensitised paper (prepared either with salts of silver or of chromium) whereupon a perfect positive image is obtained.

"Should the lines of the primary *cliché* be too strong or well-defined, more especially in the case of large pictures, they may be softened in the positive image by printing it partially, say three-fourths of the time, in contact with the large negative, and then interposing a sheet of very thin glass between the negative and the paper, or before completing the impression a sheet of any other transparent or opaline material not exceeding 0·04 of an inch in thickness may be substituted for the glass.

"The complete or partial transformation of the backgrounds as well as of the draperies, hair, dress, or any part requiring to be modified may be readily effected in the following manner:—On the positive image, obtained as previously described, is applied a sheet of extra thin glass, on which the outline of the subject is traced at a distance of say one-twenty-fifth of an inch outside of the true outlines to be protected from the action of light. On the mask cut out of yellow paper is then placed another glass of medium thickness of the same dimensions on which the outlines are similarly traced, but in this case about one-twelfth of an inch within the true outlines. In this manner the optical effect is obtained without showing the lines of demarcation, and the background may be darkened or lightened to harmonise with the subject.

"A plain or graduated background may by the same means be replaced by a landscape, interior, or other adjunct, and *vice versâ*.

"The process herein described may be applied to transparent positives of all dimensions, which, after being thus treated, will serve for the reproduction of negatives, no further retouching being required.

"Having described the nature of the invention and the manner of performing the same, I declare that what I claim as the invention to be protected by the hereinbefore in part recited letters patent is the method of applying a semi-translucid sheet on each side of a negative or positive, and of quickly and readily retouching by operating on these surfaces, as herein specified, whereby the tedious and expensive retouching of the negative itself or of the positive print is dispensed with."

The sum and substance of the above invention is that one sheet of translucent paper is attached to the front, and another to the back of the negative; and on these, instead of on the negative itself, is the retouching to be done—that on the front being performed with a sharp pencil, and that on the back by the broad sweeps of a stump and crayon.

## STEREOSCOPIC TRANSPARENCIES.

[A communication to the South London Photographic Society.]

In calling the attention of the members to this phase of photography it must be understood that I approach the subject particularly from the recreative aspect; and I am afraid that in venturing on this subject I am calling attention to what has not been a popular feature of photography, or, rather, I should say, to what has been a neglected one.

For several reasons the stereoscope has been very much forsaken—partly because of the hundreds of bad and inferior instruments and slides with which we were flooded, and partly also from another cause, viz., the bad taste displayed in many of the subjects chosen. Bad instruments fatigue the eye, and bad subjects give the whole thing a bad name. Good glass transparencies are, on the other hand, if viewed in a good instrument, always a source of pleasure;

and it is from this circumstance, and the fact that they afford such favourable ground for the amateur, that I have for some time past endeavoured to obtain the requisite knowledge and materials to amuse myself with their production.

The increased area of work which stereo. pictures offer, viz., marine and instantaneous effects, also makes the subject more attractive; but since Mr. Breese's pictures very little has been done, and it is still almost untrodden ground. I entirely confine myself to the production of transparencies by printing in the camera. My reasons for so doing are—firstly, because printing by superposition necessitates cutting the negative; and it is also necessary that the negative should be exactly the size you wish your transparency to be, and this is not always convenient. Printing by contact is very likely to damage the negative, and the preparation of plates is attended with a much greater consumption of time; and when the amusement is only to be indulged in at spare hours, and those are not many, camera printing becomes more easy.

I will now state the method I have followed in producing the slides which I now show you; it is also necessary that I inform you that all the slides I exhibit this evening are printed in the camera. The size I have adopted for the negative is 7 × 4 inches; this, whilst allowing ample margin, is not too large. The width between the lenses is three and a-quarter inches.

The camera I would recommend is a rigid one, or at least one without a bellows body, because of the tendency to harbour dust. The negative for printing a stereo. transparency from should be as perfect as possible, and dust is of all things the most troublesome. Minute defects which would not be observed in a paper print will on glass show most annoyingly.

There is a legend that the operator who prepares plates for exposure and printing by the albumen process is compelled to denude himself of his clothing, grease his hair, and hold his breath to avoid dust; but for the truth of this I cannot vouch. I can certainly say that dust is the worst evil one has to contend with; everything must be filtered carefully, and the camera, slide, and plate-box carefully sponged out, the varnish certainly filtered, and the greatest care exercised throughout to protect the negatives.

The class of negative is best described as being soft, harmonious, not too vigorous, and absolutely free from fog, a properly-exposed negative developed with iron and without intensification answering well; for additional vigour can be obtained in the printing, whereas absence of detail and too much vigour is fatal to good results.

The camera for printing must not be simply a copying camera or mere box, such as will serve for enlarging or copying purposes, but should be a carefully-constructed instrument with rack-work movement at each end, a means of laterally and horizontally moving the lenses, the focussing-glass and carrier most exactly fitting, and the negative, lenses, and sensitive plate perfectly parallel.

The negative to be copied must now be placed (varnished side outwards) in its groove, the lenses carefully adjusted, and an image focussed. And now will be seen the great advantage of copying in the camera over printing by superposition. You can enlarge, diminish, cut off the foreground, and take the best of the negative, mask portions, or print-in a sky and clouds.

The sensitive plate exposed, the colour desired can now be given; and here we get upon very debatable ground. The colour of the positive liked by many is a brown sepia, others prefer a vigorous black, and between these is a gradation of purples; but whatever colour you desire of a vigorous character your negative must be sufficiently vigorous to allow of the printing being carried far enough, the same as in paper prints, and your negative shadows perfectly clean and free from fog. The various colours are much influenced by the exposure and the method of development. Iron developer with varying exposure will give brown tones; pyrogallic development with varying exposure black and purple tones. Toning with gold and platinum will give black and blue-black; bichloride of mercury and ammonia will assist in giving sepia tones from a vigorous negative.

Now as to the best kind of glass. Remembering that you have to mount two pieces together, the thinnest glass you can obtain is that most desirable. Unfortunately, the thinnest glass is often very imperfect in quality; but a little increase in price will allow of its being selected, and that which is somewhat imperfect can be utilised for mounting as imitation ground glass. This glass is of French manufacture, and is, I think, only to be obtained at one house in London. The thin ground glass can also be obtained, I believe. I have found it a good plan to make a varnish of three grains of white wax dissolved in an ounce of ether or chloroform; this added to an amber varnish gives a very good imitation of ground glass, and is a very satisfactory method.

In printing-in clouds much the same method is adopted as with paper prints, viz., masks are used to protect the sensitive surface, and the printing is done in a diffused light. A little patience must be exercised when trying for the first time; but, like other difficulties, it is soon surmounted. A lithographic card is a great finish to the mounted slide, and also a great protection. I do not think these are to be purchased. I make my own; that is to say, I lithograph the design and have it printed, also the binding paper with a border.

F. Howard.

## ON THE PREPARATION OF NITRO-GLUCOSE.

[A communication to the Manchester Photographic Society.]

You will remember at our meeting on the 10th December last I explained to you, in a rough and ready way, my first attempt at making nitro-glucose the day before, and showed you the substance produced. Since then I have made a few more experiments—the first, on the 15th December, being to work out the idea of mixing the sugar and saltpetre together before stirring them into the sulphuric acid. I expected this would be a good plan. I thought then that the sugar would be in immediate contact with the liberated nitric acid, and so be converted at once; but I was sadly mistaken. Three fluid ounces of sulphuric acid were put into the jar first; then one ounce each of sugar and saltpetre (previously powdered, dried, and mixed together) were gradually added, and stirred into the acid in the jar. As the mixture seemed rather thin, half-an-ounce more sugar (powdered, but not dried) was put in. Temperature in the yard: freezing. During two hours this mixture was frequently stirred, and the jar then covered over with the glass plate. Cold water was then added, stirred in, and all put to filter, the result being a total failure. All was dissolved, and I had a liquid of a pale lemon colour only remaining, very clear and bright. This was the first failure; but it settled the question about mixing the two powders.

In the next experiment, made on the 22nd December, I put four ounces of dry saltpetre into the jar, poured upon it four fluid ounces of sulphuric acid (s. g. 1·843), and stirred it well in. The mixture seemed thin at first, but stiffened considerably as it got colder, requiring a strong-pointed glass rod to break it up. One and a-half ounce more of sulphuric acid was added to soften the mass, which was then covered up and left until cold.

In this experiment the large wash-hand basin was not used, a smaller conical brown ware pot being substituted for it. When all was considered cool enough three ounces (less twenty-four grains) of dry sugar were added, well mixed up, covered over with the glass plate, and left for about twenty minutes, the temperature being below freezing point. All seemed very favourable so far, and I expected to have a good supply of nitro-glucose. I was disappointed, however, as sometime during the twenty minutes I had left it decomposition had taken place, the result being a large mass of wet, spongy, black carbon.

This was the second failure, but with just opposite results; the first being a clear liquid nearly colourless, and the second a black mass of carbon. More saltpetre and sugar were powdered, and and put into the oven to dry over night for another trial next day.

In this experiment (made the 23rd December) only two ounces of dry saltpetre and three fluid ounces of sulphuric acid were used. The large wash-hand basin, with water in it, was put out of doors, the temperature being 28° Fah. A film of ice soon formed on the water, and when the jar was about to be used the thickness of ice had increased to about the tenth of an inch. The jar containing the acid and saltpetre, covered as before, was occasionally moved about during an hour and a-half. The mixture was then not quite as stiff as in the last experiment. One and a-half ounce of dry sugar, in fine powder, was then put into the jar, and incorporated by continual stirring and turning over the mass to keep the heat down, by changing contact with the bottom and sides of the jar. The compound became very stiff, and at last formed into a ball resembling pipeclay. As I had no more acid I was obliged to let it remain so, but continued driving the pointed glass rod into it. Cold water and bits of thin ice were then added, and ultimately all was put to filter.

Next day several doses of cold water were passed through the white powder on the filter to wash it free from all acid, &c. It was then treated as in the first experiment mentioned, and, finally, I found I had 530 grains of nitro-glucose. The powdered and dried lump sugar used weighed one and a-half ounce, or 656 grains—the weight of nitro-glucose being 120 grains less. The loss in converting was equal to 18·3 per cent., leaving 81·7 per cent. as the percentage of nitro-glucose obtained.

This second batch, I believe, is very good. It dissolves readily in collodion, and also, but slower, in methylated spirit. A few drops of

this last solution put into water gives a fine white cloud, which is excessively slow at settling.

The next experiment I made was on the 7th January last. Three and a-half ounces of dried and powdered saltpetre were put into the jar. Upon this was poured four fluid ounces of sulphuric acid stirred well in, then the jar was covered over with the glass plate, and surrounded with water in the large wash-hand basin as before. Temperature in the yard: 46° Fah. In about two hours another ounce of acid was added, as the mixture had become quite hard. Three and a-half ounces of dried sugar were then gradually stirred in. The sugar made the mixture stiffer at first; but heat began to be produced, which made it quite thin, and show a yellow colour. I could see that mischief was brewing, and in a few moments carbonisation began, accompanied by volumes of red nitrous acid gas, which drove me away, the result being a large quantity of black, spongy, wet carbon, as before. This was the third failure. In this experiment I had been again operating upon too much material for the size of jar, and there was a great change of weather.

On the 28th January, for the sixth and last time of trying, I endeavoured to repeat the experiment made on the 23rd December, when I obtained 530 grains of nitro-glucose. The same quantities of materials were used, but the temperature out of doors had risen 24°, the thermometer being now at 52° Fah. instead of a keen frost. While the mixture of acid and saltpetre was cooling rain fell, and I had to wait till it ceased. The mixture when cooled was only half solidified, and the sugar made it still thinner. I should have had the carbon process over again directly had I not at once brought up a force I had in ambush in the shape of a jug of cold water, to quiet the rising tendency, and produce tranquillity, &c. All was put to filter, and after washing and kneading in warm water next day I found I had 471½ grains of nitro-glucose, being 184¾ grains less than the original weight of sugar used. This gives 28·17 per cent. as the loss in converting, and leaves 71·83 per cent. of nitro-glucose obtained. This result is about ten per cent. worse than the other—attributable, I think, to the higher temperature and greater moisture of the weather. My appetite for making nitro-glucose is now satisfied. I set out to try whether saltpetre could be used instead of monohydrated nitric acid, and I have proved that it can, and that ordinary commercial sulphuric acid may be used in place of fuming sulphuric acid.

In the absence of a proper arrangement for carrying away the corrosive vapours it is not a pleasant process. You are liable to be "over-exposed" out of doors, and may get a chill which will affect your "tone;" then "over-fuming" is sure to happen, and you get "decidedly acid," so you must not begrudge a good washing. You had better not have your Sunday clothes on, or when you think you are "well mounted" you may discover some "spots" which will be rather difficult to "stop out." M. Noton.

## THE RELATION OF LIGHTING AND EXPOSURE TO TEXTURE.

[A communication to the South London Photographic Society.]

Mr. Neilson, in a short but able article contributed to the *Photographic News Year Book* for this year, has struck a key-note worth following up. The article in question is upon developers and texture. It is, as he says, a somewhat neglected subject, but it is one which should demand serious attention; for there are, in my opinion, two things which have lately come into universal use among photographers calculated to do great injury to photography artistically, and are certainly utterly destructive to texture. I allude to retouching upon the negative and the use of reflecting screens, or, rather, I should say, the abuse of these, for both in their places are useful, and, properly used, may help us to secure natural texture where we could not get it without them.

It may be asked—What do you mean by "texture?" Texture upon a photograph means a very different thing to texture in oil painting or water-colour drawing. In oil or water colours the artist uses certain means for obtaining a natural texture (in flesh painting, we will say); he has to load up his colours, glaze, and scumble, and so get a texture upon his canvas which, when looked into, is anything but the texture of the smooth skin of a beautiful young lady, yet when seen at the proper distance gives that texture with all its soft, glowing colours and gradations to the life. It requires no departure from nature to get natural texture in a photograph.

Photography has been admired by artists for its wonderful reproduction of the texture of different fabrics, and has been used by them as guides on account of its accuracy. It has failed somewhat in flesh, owing to the fact of yellow being reproduced as a dark instead of a light colour, all flesh, however fair, being made up of yellow to a much greater extent than an inexperienced person would think.

To mend this inaccuracy retouching was called in, and if it had been confined to this, and gone no farther, it would have been a gain instead of a reproach; but with some persons it seemed that once the pencil was in their fingers they did not know where to stop, and the result, in nine cases out of ten, is the destruction of all natural texture and the substitution of a mechanical stipple all over the face, representing to the eye nothing so much as a plaster cast or a face cut out of stone. How many times have I heard the public praise these things in terms which should be their greatest condemnation? "How beautiful it is—just *like a statue!*" Not "How like life!" simply because they were *not* like life. In these overworked abominations we have an incongruity most offensive to an artistic or educated eye—a marble head with drapery the fabric of which is reproduced with the greatest fidelity.

The remedy in this case is easy; do not tamper with the natural texture in the negative, mend all defects, matching (as well as human eyes and hands can do) the texture, and do not attempt to substitute another, for all such attempts must end in failure. There is nothing so beautiful as the texture of flesh in a good negative, and it is worse than folly to do away with it and substitute a stippled mechanical one, which must end in smooth hardness, making the flesh look like polished stone.

Before proceeding to show how the use of reflecting screens tend to the destruction of texture in flesh, I would wish to say a few words as to the best means of securing a natural texture in the photograph. Mr. Neilson, if I understand his article aright, says it is to be secured by using a strong developer after a weak one; in my experience it is entirely a matter of lighting and exposure. Given the right lighting and exposure, I will guarantee to obtain texture with any developer. Try a sitter in the ordinary ridge-roof gallery, blocking out all side light. Look at the face; the more front the light the less marked the features and texture of the skin. Now close all front light and use only side light, and see how all is reversed. The texture of the skin is exaggerated, and every pimple looks at least twice the size it is. Every photographer who is in the habit of taking the side-lighted photographs, or the so-called "Rembrandts," will at once recognise the accuracy of this description. With the light from behind the sitter the accidental marks and texture are generally much exaggerated; and if the intensity of the light be not modified in some way it will give no end of work to the retoucher. It is for this kind of portrait that the use of reflecting screens has been mostly recommended; and, if judiciously used, they are of great value in softening the heavy shadows, and getting rid of the exaggerated texture caused by the extreme side light.

Over-reflection will give exactly the same effect as over-touching—the destruction of the natural texture—in the same way as the front lighting. In my own practice I never use a reflecting screen at all. If a judicious combination of side and front lights be used there is no need of them; and for the Rembrandts I close up all light at the camera end of the gallery, bringing the sitter half-way up, leaving the side light behind all open, and softening the shadow with a high side light, or combination of top and side, in advance of the sitter, as the face may require, and with this lighting can always secure texture if the right exposure be given.

In my experience the exposure has as much to do with securing natural texture as the lighting. An under-exposed negative which has to be forced in developing will be coarse in texture, while over-exposure will be utterly destructive to all texture.

Mr. H. P. Robinson's lesson in the same *Year Book* upon softness, taken with Mr. Neilson's upon texture, is a salutary dose which photographers well do well to take; for there is just as much want of texture in the over-softness condemned by Mr. Robinson as in the hardness condemned by Mr. Neilson. But, while agreeing with Mr. Neilson so far, I must say, with all due deference to him as an artist and a photographer, that I cannot agree with him in seeking texture in developers. Texture is upon the model, and can be secured by any developer, provided the lighting and exposure have been properly adjusted. G. Croughton.

## FOREIGN NOTES AND NEWS.

Meeting of the Berlin Photographic Society. — Dr. Sell's Sulphuretted Carbon Lamp.—Mr. Denier's Paste Retouching Surface.—Herr E. Kaders' Albumenised Paper.—An Academy of Photography.—Professional Portraiture in Carbon.—Mr. Johnson's Patent.— M. Terpereau's Portable Tent.— The Wheelbarrow Tent.—M. Ponjade's Substitute for Retouching.—The Reflectoscope.

At the meeting of the Berlin Photographic Society on December 18th Dr. Sell illustrated by experiments the manner in which he

proposes to apply the sulphide of carbon light to photography. Dr. Sell generates the nitrous oxide by pouring diluted nitric acid upon copper, and he has constructed a lamp in which it may be safely burnt, and by means of which a continuous stream of light may be thrown upon the object. He brought to the meeting two of these lamps and a gasometer filled with nitrous oxide. The flame was of a bluish-white colour—not very clear, yet possessing a strong chemical power. It has the advantage over magnesium light of being very cheap and not of dazzling the sitter. By the light of these two lamps one or two persons were taken in from forty-five to sixty seconds, and the clothes only appeared under-exposed. Dr. Vogel's experiments with the spectroscope confirm the idea that the rays from this lamp are very strong.

A writer in a German paper says that the "Lambertype" is rather the development of an old method than a new invention, and that a M. Jean Hock has retouched his pictures in a similar manner for many years. The following way of applying a paste retouching surface, in order to soften a too-sharply-defined background in large pictures, as practised by Mr. Denier, of St. Petersburg, may be new to some of our readers who are fond of experimenting:—Take a little paste made from potato starch and dilute it with gum arabic and water. Lay the negative, varnish side uppermost, on the nearly horizontal lower frame of a retouching desk. Draw a line with a sable pencil dipped in the diluted paste round the part of the background or figure to be toned down, and fill up the enclosed space with broad strokes running into each other. When this operation is completed draw a firm stroke from the outer edge of the paste-covered surface to the nearest point on the margin of the negative, tilt the plate quickly into an upright position, and let the surplus paste run off. After the remaining paste has dried it will present as good a surface for lead-pencil retouching as dead varnish.

We understand that the paper employed by Herr E. Kaders, of Dresden, for albumenising is neither Rive's, Steinbach's, nor Konigsteiner's. This is interesting, as Rive's paper is generally considered unrivalled. Dr. Vogel speaks highly of the new paper, and M. Talbot has successfully subjected the silver paper to the test of the ammoniac process.

A recent number of the *Photographische Mittheilungen* contained a long article on the education of photographers. After descanting at some length on the variety of subjects with which a first-class photographic artist must familiarise himself if he wish to keep abreast of the times, and the difficulties with which a young and aspiring photographer has to contend in the attempt to make these subjects his own, the writer earnestly advocates the foundation of an academy of photography in which the course of study should embrace all those branches of science and art which the first-class photographer requires to master. For a portrait photographer this course would include drawing, as a training for the hand in retouching and for the eye in posing; chemistry, to enable him to understand photo-chemistry; optics, that he may understand his lenses; anatomy, that he may not pose his sitters out of drawing; lectures on art and art-history, illustrated by copies of the works of the great masters, to train his artistic taste; and opportunities of posing and lighting the living model. The practice in lighting and posing would be the greatest boon of all, since all the other subjects may be learned by anyone who can afford to reside for some time—say six months or a year—in one of the large centres (such as Berlin or London) where classes for science and art, public museums, and picture galleries afford considerable facilities to the industrious aspirant. Indeed, this course of study at museums, &c., is strongly recommended, in the absence of the much-to-be-desired academy, to all those young photographers who wish to rise above a mere mechanical performance of some branch of photographic operations, such as printing, retouching, &c.

M. Franck de Villecholle—a gentleman whose name will be familiar to readers of these *Notes* and the letters of Professor Stebbing—has now become one of the leading champions of carbon printing in France as applied to portraiture. He is not only a licensee of M. Liébert's process of "*chromotypie*" (pigment printing for portraiture), but he is also an agent of the Autotype Company, supplies their tissue and other materials, and gives lessons in their process. In fact, carbon printing is really beginning in France to supersede silver printing for portraits, and professional photographers are seriously taking it up. The long-predicted revolution has commenced, and, according to the editor of the *Moniteur*, the wonder is that it has been delayed so long.

Mr. J. R. Johnson has advertised in Paris a caution to French photographers against buying licenses for any carbon process which may be an infringement of his patent dated March 15, 1869, No. 84,991. He advises persons who intend practising carbon printing professionally to apply to him directly for information respecting this patent, at his address, No. 39, Rue Borghése, Neuilly-sur-Seine. Our note of this may be useful to some of our foreign readers.

M. A. Terpereau has published the description of a portable dark tent for working the wet collodion process out of doors, which he finds very convenient. It consists of three pieces of board hinged together, and looking, when opened out, like the two covers and back of a book. In that state they measure a square metre, and form the base of the tent. At each corner of the outer boards, and also at each end of the central board, is fixed a wooden pillar ninety centimetres high. Over all is then spread a suitable black cloth. The breadth of the central board is ten centimetres. This tent, of course, folds up flat, like a book, and packs very neatly, with the black cover and pillars, between the two outer boards. It would then resemble a portfolio about forty inches long, eighteen inches wide, and four inches thick.

We may here take occasion to observe that this is larger than a wheelbarrow tent in the possession of the writer, in every dimension, which contains, when packed up, the wheel, handles, and other iron work, and also the black cover, in which he has often taken negatives 12 × 10 without the least inconvenience. When this wheelbarrow tent is rigged out it can be wheeled from place to place without much trouble, and its tray holds the nitrate bath, camera, and *all* the other paraphernalia; so that any man endowed with moderate health and strength may go about in the country with it, taking 12 × 10 negatives, without any assistant to help to carry his traps. Having only one wheel, it will go along quite rugged footpaths up hill sides. There is even a place between the wheel irons for stowing a vessel which will hold two gallons of water. With all this, and all his paraphernalia, the photographer will find himself independent of any help whatever.

M. Ponjade recommends photographers to give their portrait lens a turn of the screw inwards or outwards, after half the proper time of exposure has elapsed, in order to soften the details of the negative, and render retouching unnecessary.

We have alluded on two or three occasions in these *Notes* to the reflectoscope of M. Van Tenac for viewing or photographing enlarged images of opaque objects. This instrument is now advertised for sale at a price of 320 francs (£12 16s.), lens included, and also the magnesium lamp.

## WARMING STUDIOS.

[A communication to the West Riding of Yorkshire Photographic Society.]

From what little experience I have had in the practice of photography I have found that the want of a proper system of warming and ventilating studios is seriously felt. My purpose in this paper is to point out what I believe to be the best means of accomplishing that most desirable object—a studio properly warmed and properly ventilated. Every part of the room should be equal, or nearly equal, in temperature; all the air in the room should be constantly changed; and the foul air and deleterious gases always generated in such structures should be got rid of as they are formed, and give place to a constant supply of fresh, pure air.

There are three modes of warming studios usually adopted, to all of which, on various grounds, I strongly object. I purpose now to point out a plan which will be found to be better, cleaner, healthier, and cheaper than any or the best of the three.

*The Open Fireplace System.*—This is objectionable in a studio on account of its not acting uniformly all over the room; although by stopping up all crevices for the inlet of cold air you can raise the room to a considerable temperature, yet the heat is oppressive and unhealthy on account of the foul air not being replaced by fresh oxygenised air. In addition to this, the fresh air which enters in any case to supply the fire being colder and heavier than the air already in the room lies at the bottom in a distinct stratum, and as it becomes heated near the fire passes away up the chimney, taking with it the greater part of the heat from the fire, thereby causing great waste of fuel. Cold draughts, smoke, and the photographer's great enemy, dust, always attend the open-fire system.

*The Close Stove System.*—In a studio warmed by a close stove there are neither draughts nor smoke, and comparatively little dust; therefore several of the disadvantages of an open fire are obviated. There is, however, one disadvantage under which it labours which is of great importance, viz., that only a small quantity of the air reaches the stove, and, being usually made of cast iron, the heated surface acts very injuriously upon that portion of the air which comes in contact with it, rendering it unfit for breathing, and frequently causing headaches and

other unpleasant sensations owing to the large quantity of carbonic oxide and sulphurous gases given off by all heated cast-iron surfaces in contact with fire.

The third system—that of hot water circulating through pipes—is used to a certain extent, and, although less objectionable on many grounds than the other two, it has its disadvantages. The principal of these are—the great bulk of the apparatus, the expense of fixing, the chances of water freezing and bursting pipes, the constant liability of leaking from the pipes, joints, &c., and the great length of time required to keep the fire going before any effect of warmth is produced, and consequent loss of fuel. On this point I may say that I have the best authority for stating that only half the heat of combustion is applied to use by any mode of warming by water.

The system to which I will now call your attention as the one I adopt is, in my opinion, the best adapted to the wants of the photographer of any hitherto used. The introduction of the George's calorigen—with which all readers of the photographic journals will be familiar—is a step in the right direction, but falls very far short of realising the full capabilities of the system.

I may here tell you that warming rooms to very high temperatures has been my closest study for the last twelve years. The result of that experience has been the production of a stove for small rooms, and of a furnace and apparatus for large rooms and public buildings, which embody all that can be done in securing the advantages to be derived from an abundant supply of fresh, pure air, with the benefit of utilising the heat of combustion to its fullest extent, in their application to warming and ventilating purposes.

I was led to the idea of their suitability for warming studios from having, some time ago, come into possession of a gallery of my own. Putting in one of my stoves I have had the benefit of experience in its use ever since, and I would not now like to be without it. I believe that an abundance of pure, dry air is what the photographer most requires for every part of his premises, and that it would be found to be better for his health, better for his comfort and pleasure, and better for his business. If he take up his cloth or leather to wipe his glass previous to coating a negative, what is more disagreeable than to find it almost saturated with moisture? The glasses themselves, if cleaned some time beforehand, are found to be coated with a film of moisture—which is a prolific source of streaks, and the films slip off in washing under the tap. All these annoyances disappear like magic under the influence of warm, dry air. The cloths are found crisp and dry, and, if the glass for the negative be held for a moment over the stove just previous to coating, there will be no such thing as the film dancing off the plate, or even of driving it off with reasonable usage.

In speaking of dry air I do not mean that the air is absolutely dry, but that there is no visible moisture in the room, air having the property of taking moisture in proportion as it increases in temperature. Thus, at a low temperature, this capacity is very small, but it is rapidly increased as the temperature is elevated. Then any dampness or moisture ceases to be visible, and the warmed air (for instance, a sponge with water) takes up the moisture and holds it in solution. You can test this by taking a tumbler of cold liquid or a looking-glass into a room heated up to two or three hundred degrees with what you suppose to be dry air, and you will find the cold surface immediately covered with a film of moisture. However, if at any time the air be thought to be too dry it can easily be altered by placing water in a receptacle prepared for it in the stove, or by fixing a small fountain of spray inside a glass vessel in a convenient part of the room or studio. The effect would be both ornamental and very refreshing and agreeable when the room was warm.

An arrangement can be easily fitted at the top of the stove to receive wet negatives as they are made, where they will dry without trouble or care, and keep warm ready for varnishing at any convenient opportunity. The operator will find it the quickest, cleanest, and least troublesome means of varnishing he can possibly employ. Another advantage is that it is the most efficient ventilator both for winter use with fire and for summer use without fire. If the cold air to supply the stove be taken from a cellar or other cool place it will aid very materially in modifying the high temperature which usually exists in all glass structures in hot weather. There is no difficulty in keeping baths, chemicals, and everything in order, as you can have a summer temperature, with a full supply of fresh air, all the year round.

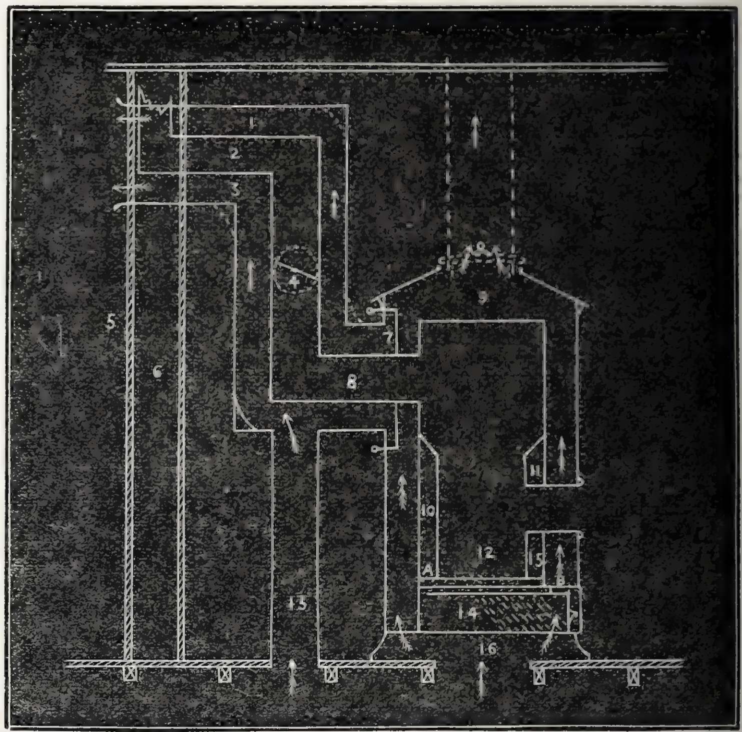
I know it has been the custom for many years to cry down heated air as an objectionable mode of warming rooms, but I have found that the various theories put forth do not hold good in practice. The evils complained of do not apply to air which is constantly changed in the process of heating, but only when the same air is heated over and over again. I have often proved that air can be raised to very high temperatures without being vitiated. I have seen hundreds of instances of persons suffering from congestion of the lungs, and other disorders of the respiratory organs, relieved at once on entering a room warmed in this manner. I claim this as a point of superiority over every other form of stove—that, however hot it may be in the room, ventilation goes on in the same ratio. The hotter the stove the quicker the admission of pure air, and, however warm the room may be (and I have often tested it at very high temperatures), there is no feeling of oppressiveness through the want of purity of the air. This result is mainly attributable to the mode in which the heat is applied. I leave all stoves made either wholly or in part of cast iron out of the question entirely, as it is only from a surface of best wrought iron that good results can be got; and I hold that no system of warming can be correct that does not secure a regular and uniform change of the entire contents of the room from the top to the bottom at regular intervals.

Taking the calorigen as the best stove in the market, I assume the points of difference to be greatly in my favour. First, I can warm a much larger area with the same quantity of fuel. Second, the air is in greater volume and purer. Third, where the conditions of the structure of the building will admit of it, I can warm two or three rooms easily as one, and from the same stove. Fourth (which is of paramount importance), it will not cost above half the price.

In reference to the first and second of these points, I may say that the passage for air is much too contracted in the calorigen stove, and has to strike too many points of heated surface before it can discharge itself into the room. If you take a sketch of that stove you will see that the air passage is formed of a pipe which, after passing perpendicularly through the fire, is made into a double coil, the end of which is terminated at the top of the stove. Now, the air in its passage through this coiled pipe is compelled to strike so many points of heated surface that it must of necessity become superheated, and consequently, to some extent, vitiated. My stove is made as far as possible on the principle that air should only strike the heated surface once and then come off into the room; and, as I have before pointed out, the effect of the stove becoming very hot is not to vitiate the air, but to make it move quicker, and so warm the rooms sooner.

It is common in all close stoves for the ashes and clinkers to choke up the grate bars, and the fire has to be put out to enable it to be cleaned. In order to overcome this difficulty I have put in a grate, with an arrangement by which half the bars can either be drawn out or one end

Upper Room.



Cellar, or Other Room.

1. Hot air. 2. Smoke Pipe. 3. Hot air. 4. Damper. 5. Next room. 6. House flue. 7. Damper. 8. Smoke pipe. 9. Hot air chamber. 10. Fire bricks. 11. Fire bricks. 12. Fire. 13. Cold air pipe. 14. Ashes. 15. Fire bricks. 16. Cold air chamber. The dotted lines in ashes drawer show half the lines let down to enable fire to be cleaned.

let down into the ashes drawer, the other end working on a pivot A. Thus, every alternate bar being away, you can insert an instrument between the other bars and let down the dead fire into the ashes drawer. The loose bars being now replaced and held in position by the catch B, the fire can be replenished and all goes on as usual.

Another important feature is that as soon as the fire is lighted the heat begins to come off, and in an incredibly short time the change is felt by an increase of temperature all over the room. When it is warm enough you can regulate the fire to make it burn quickly or slowly at pleasure, so that once set going properly it requires very little attention. I have frequently had a fire in a small stove with no more fuel than you could hold in your hands, which kept lighted from eight to ten hours at a time. So long as any heat remains in the stove, even after the fire has died out, you still continue to get the benefit of it.

It is a great advantage, also, that these stoves, whether of wrought iron or bricks and iron, can be placed in any out-of-the-way corner of the studio itself, in a small room adjoining, or in a room underneath, and still have the same effect of heating the studio and other rooms

intended to be warmed. But in order to make the most of them they require to be specially made for the place they are intended to occupy and the work they will have to do. The body of the smaller stoves is in all cases the same, only varying in size to suit requirements. The fittings vary according to condition of flues and the position of the room to be warmed.

Although this system has been patented by me, more especially as it applies to manufacturing purposes, yet I would willingly lay aside the terror of the patent law if any member of our Society would like to get one made for his own use. I may say, in addition, that to the virtue of requiring no castings (except the grate, for the smith will be able to complete the work himself) I will not only give my consent but will assist any one of you with my advice to put the stove in working order. JOHN HOWARTH.

# Meetings of Societies.

## SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE usual meeting of this Society was held on Thursday, the 11th inst.,—the Rev. F. F. Statham, F.G.S., the President, in the chair. The following new members were elected, viz.:—Messrs. Stamford Sheridan Young, J. Nesbit, Wm. Walsham, and Captain Mackay Heriot.

Mr. Frank Howard read a paper on *Stereoscopic Transparencies* [see page 88], and exhibited a number of charming pictures taken by the method described in that paper.

The CHAIRMAN conveyed to Mr. Howard the thanks of the Society for his paper, and his own gratification in the examination of the beautiful pictures exhibited by that gentleman. He considered it very desirable that an impetus be given to the re-introduction of stereoscopic pictures, by which, in a far greater degree than any other kind of photograph, the beauties of nature were presented to the eye in a real and forcible manner.

Mr. T. SEBASTIAN DAVIS agreed with the President in his estimate of these pictures. Nothing recreated a scene once visited in such a way as a stereoscopic picture.

The CHAIRMAN further observed that one had the pleasure of travelling abroad while sitting quietly at home by the fireside. They thus enjoyed a great privilege in seeing places so far away; and he could not conceive an evening more pleasantly spent than with a stereoscope and a number of well-selected views.

Mr. HOWARD (in reply to a question) said that it was not at all difficult to print-in clouds in transparencies. All that was required was care in masking certain parts.

Mr. REID suggested the advisability of printing portraits as stereoscopic transparencies, and suspending them in the windows of the photographers' show-rooms. He thought that a demand for stereoscopic portraits would thus be created.

Mr. FOXLEE said that this had been tried, but the public did not seem to care much for stereoscopic portraits. Seeing, however, that the bi-lens camera was so much employed in the production of *carte* portraits an attempt at re-introducing this kind of portrait could be made without much trouble. In producing a transparency on wet collodion in the camera the tone, he said, was influenced to a great extent by the duration of the exposure. A sepia tone could be obtained by using an iodised collodion and a pyrogallic developer, and giving a quick exposure.

Mr. J. T. TAYLOR exhibited a pseudoscope of an improved form, and gave a description of its action and uses when applied to reversed binocular images. By means of that instrument the images shown upon the ground glass of a stereoscopic camera were instantly thrown into true relief as in a stereoscope, enabling the artist to see the precise effect that would be obtained.

A paper by Mr. G. Croughton, on *The Relation of Lighting and Exposure to Texture*, was then read. [See page 90.]

Mr. WILKINSON considered that there was more lifelike texture in foreign than in English photographs.

Mr. MORGAN: It arises from the colour of the skin.

The CHAIRMAN considered that the light had much to do with it.

After some discursive remarks on the relative positions occupied by English and foreign portrait photographers, in which various members took part, a vote of thanks was accorded to Mr. Croughton for his paper.

It was announced that the presentation portraits of the President printed in carbon from a negative by Mr. Blanchard was ready to be handed to the members present. The proceedings then terminated.

## MANCHESTER PHOTOGRAPHIC SOCIETY.

THE monthly meeting of this Society was held at the Memorial Hall, on Thursday evening, the 11th inst.,—Mr. W. T. Mabley, President, in the chair.

After tea Mr. Noton exhibited the sulphur-oxygen light.

The minutes of the previous meeting were read and passed.

Mr. M. NOTON then read a paper *On the Preparation of Nitro-Glucose.* [See page 89.] He exhibited a sample of the article, and also some of the carbon alluded to in his paper.

A short and unimportant discussion followed.

Mr. Oakes, of Bolton, who was introduced by Mr. Brothers, exhibited a number of the celebrated stereo. slides by the late Mr. Breese. These, although new to some, were well-known to the senior members of the Society.

The thanks of the meeting were voted to Messrs. Noton and Oakes, and the meeting adjourned at an early hour.

## WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.

THE ordinary monthly meeting of this Society was held at the Victoria Hotel, Bradford, on the evening of Monday, the 1st inst.,—Mr. J. W. Gough, President, in the chair. There was a numerous attendance of members.

The minutes of the last meeting having been read and confirmed, the following gentlemen were elected as members:—Messrs. J. Bottomley, J. Beldon, W. M. Arundale, and A. Coe, Bradford; Mr. S. S. Priestley, Huddersfield; Messrs. Wm. Huggon and G. A. Huggon, Leeds; Messrs. Wade, J. Whiteley, and H. Edmunds, Halifax; and Mr. Catford, Ilfracombe.

The rule announced for discussion—namely, as to the propriety of the Society's holding exhibitions and offering prizes for competition—then came under notice.

Mr. SMITH (Halifax) suggested that the words "the Society *shall* offer prizes" be altered to "the Society *may* offer prizes."

This proposition met with general approval, and on the President putting the rule in its amended form it was unanimously carried.

Mr. J. Howarth then read a paper on *Warming Studios* [see page 91], and laid on the table a large diagram of his heating apparatus, which was inspected by the members with great interest.

Mr. WHITELEY stated that he had much pleasure in testifying to the efficacy of the stove and its great heating power, as he had had one in operation for some time.

In reply to a question by a member,

Mr. HOWARTH said that his apparatus might be fitted up at a cost (roughly estimated) of about three guineas.

A communication, for members' use only, from Mr. W. H. Brunton, Whitehaven, *On the Acceleration of Exposures*, was then read by the Secretary.

On the motion of Mr. Smith a vote of thanks was unanimously accorded to the gentlemen who had contributed papers.

Mr. Greaves having kindly consented to demonstrate the development of carbon prints at the next meeting, the proceedings terminated.

# Correspondence.

## ART UNIONS.

*To the* EDITORS.

GENTLEMEN,—Your "Peripatetic Photographer" in his *Notes* last week refers to a reported collapse of "the art union of the Photographers' Benevolent Association" on the ground of illegality as a lottery.

Permit me to point out that, under the 9 and 10 Vict., cap. xlviii., termed "An Act for Legalising Art Unions," voluntary associations for the distribution of works of art, or of money to be expended in the purchase of them, are rendered legal provided that the charter, deed, or instrument constituting the association and the rules and regulations of it be approved by the Board of Trade.

The Association above referred to has simply to apply to the Board and there is little doubt approval will be obtained.—I am, yours, &c., P. LE NEVE FOSTER.

*London, February* 15, 1875.

## DEVELOPMENT BY MEANS OF FUMING.

*To the* EDITORS.

GENTLEMEN,—The time has come when amateurs would do more in photographic work, but they must be enabled to do so without soiling a white kid glove—and why not?

What is wanted is the developing and fixing by vapour the mechanical part, such as was obtained by the old mercury and iodising boxes in the daguerreotype process; and, as alkaline or acid vapours can be produced easily, some photographic chemist should direct his attention to what vapours would produce the picture on the sensitised plate so fixed that all future operations—printing, enlarging, &c.—could be subsequently done by a professional photographer.—I am, yours, &c.,

22, *Red Lion-square, London,* J. SOLOMON.
*February* 12, 1875.

## COST OF THE PHOTOGRAPHIC EXHIBITIONS.

*To the* EDITORS.

GENTLEMEN,—I think it would have been well if Mr. H. Baden Pritchard, before giving you his version of my remarks concerning the Exhibitions of 1873 and 1874 (made at the recent meeting of the London Photographic Society), had taken the trouble to correct his own impressions by looking into the accounts published last year by himself.

He will there find—1. That the total cost of the Exhibition of 1873 was £112 13s. 7d. (and not £128, as he tells you in his letter). 2. That the admission fees and sale of catalogues realised £83 odd; and that £30 was received for special advertisements inserted in the catalogue. 3. The total amount taken was, therefore, £113, and not £130, as stated by Mr. Pritchard. "*Quis custodiet ipsos custodes?*"—I am, yours, &c.,

*London, February* 15, 1875. JOHN SPILLER.

## LONDON PHOTOGRAPHIC SOCIETY.

*To the* EDITORS.

GENTLEMEN,—I enclose a copy of a letter forwarded to me by a friend, which he vouches for as an accurate transcript of a circular received by him, with royal arms at the top, the official stamp of "Photo. Estab., War Dept.," and on the envelope "O. H. M. S.":—

"*Woolwich, January* 26, 1875.

"DEAR SIR,—As all country members have a vote in the election of officers of the Photographic Society, may I ask you to support Mr. Glaisher, F R.S., as President again, his claims being, I think, very just. During the years he held office he guided the Society through much debt and difficulty, and his known scientific position renders him, moreover, very eligible for the office.—Faithfully yours, "H. BADEN PRITCHARD,

"*Late Honorary Secretary.*"

I should like to be assured of the non-authenticity of the above, because it seems to me to involve a serious breach of good faith, remembering that in the announcement of the election by the President, in January, we were given to understand, and did understand, that as a matter of conciliation, and to show our appreciation of the last Council, it was hoped and believed by its members that we should re-elect it *en bloc*.

Certainly Mr. Spiller (if not the entire Council) deserved this sign of our recognition of his eminently high-toned and conciliatory attitude throughout the whole crisis which threatened the dissolution of the Society. Had it not been for him the Society would to-day have been dissolved; and it seems to me that in electing over his head another candidate whose conduct and influence have been the immediate cause of all our divisions, and whose exit from the office to which he clung with so undignified a tenacity was made in a manner as insulting to the Society as it was absurd, we have shown ourselves wanting both in self-respect and consistency.

Mr. Glaisher has, I am told, done no more than Dr. Mann and others towards relieving the Society of its burthen of debt. His incapacity and offensive manner in office have very largely contributed to paralyse the efforts of a portion of its members and to make the proceedings ridiculous. No one who was present at the meeting when he definitely retired is likely to forget the browbeating he endeavoured on that occasion to inflict on the majority which refused to accord to his vanity all that he demanded, so that even his own partisans were obliged to cry "Shame!" at his conduct. That same majority, in order to pay respect to the past of the Society and give Mr. Glaisher an opportunity to retire with honour, awarded him a medal, on the occasion of what we supposed to be his *definite* retirement, in consideration of his long services.

The proposal of his candidature under these circumstances is a gross injustice to Mr. Spiller and an insult to the Society; and this vigorous secret canvassing of the members who had little or no opportunity of learning the facts connected with Mr. Glaisher's retirement was adding to the insult by a means which I do not care to characterise. If this canvass had been open and above-board it would still have been impolitic and disrespectful to the Society, because the manner in which Mr. Glaisher went out made it inconsistent with the self-respect of the Society to ask him to come back again, and because it was certain to renew discussions which had been allayed by the *concession of the majority to the minority;* but the total misrepresentation of the case in the above circular discredits whoever had connection with it.

But the fact is—and it is time to speak openly on this matter—there is a little clique in the Society who have long pulled the wires and worked it for their own purposes, and who, if they cannot rule, will try to ruin it. Mr. Glaisher was their stalking-horse, and the reform last year in the Society was the destruction of their game. So long as nobody questioned, they were able to hoodwink the straightforward members of the Council and play their game in security; but it was impossible under Mr. Spiller to carry it on (as it would have been with any other member of the Council likely to be elected to the presidency). *Hinc illæ lachrymæ* and all the solicitude about Mr. Glaisher's reward for his laborious services.

The action of the Society has been paralysed for years, its influence in every way diminished, some of its most efficient members driven out of it entirely, and the zeal of many others cooled down by the knowledge that it was ruled mainly in the interest of a few individuals. No scientific investigations could be undertaken by the Society—it could not perform the simplest function of a learned society—because the "ring" which controlled it might be dissatisfied with the results. No investigator cares to lay before the Society the results of his investigations, because he knows that there is no probability of having it adequately looked into or his labours recognised.

Nor is it possible to raise the *status* of the Society, or give it the public influence we are always talking about, so long as its efficiency is to be subordinated to Mr. Glaisher's claims to a certain honour or the private interests of a few privileged individuals. If the members at large wish to increase the efficiency and dignity of the Society they must act with more energy than past times have called forth, and not let less than a quarter of the votes (and stimulated by secret circulars at that) control the election in so important a case as this was, and compel the Society to stultify itself so completely as it has done by the re-election of Mr. Glaisher.

I wish to call the attention of the really conservative and right-minded members of the Society and of the *Council* to the fact that this new firebrand has been thrown into our midst, not by the reformers, who had accepted the compromise in good faith, but by the friends of Mr. Glaisher, who, after having been beaten in an open contest, have at the first opportunity repudiated the understanding which the reforming majority were weak enough to consider as binding. If Mr. Glaisher receive new affronts, or the Society fall into new dissensions, they will remember who is responsible.—I am, yours, &c., W. J. STILLMAN.

8, *Altenburgh-gardens, Clapham Common, S. W.,*
*February* 15, 1875.

*To the* EDITORS.

GENTLEMEN,—The report of what Mr. Spiller said at the last meeting of the London Photographic Society renders it necessary for me to say a few words.

When it was seen that I was proposed for president, a number of my friends wrote to me asking what I wished done, and in many cases enclosed me their ballot papers to fill in. In all these cases I, as a point of honour, struck out my own name, even as vice-president. In this way I know that I deprived myself of such a number of votes as would have obtained for me the latter position.

This was the necessary sequence of Mr. Spiller having proposed me without my knowledge; and I regret having been proposed in opposition to Mr. Glaisher, for whom I have a strong personal liking and esteem.—I am, yours, &c., H. STUART WORTLEY.

*London, February* 16, 1875.

## COLONEL WORTLEY'S RETIREMENT.—OIL LAMPS FOR LANTERNS.

*To the* EDITORS.

GENTLEMEN,—I was prevented by press of duty from sooner noticing Colonel Wortley's letter in which he announced his retirement from any further *commercial* connection with our favourite art. One of my friends, at all events, has been a sufferer by it, for he had ordered ten dozen plates to take out to Algiers, and could not get the order fulfilled. I, too, should suffer from it very much if I thought it implied any other than commercial retirement; for if I have not been pecuniarily a customer it has been only because through the generous confidence of the inventor I have been made a gratuitous partaker of all Colonel Wortley's improvements.

But much more than this: I owe to his original paper read before the London Photographic Society my sucessful initiation into the preparation of the most certain, permanent, and, I think, perfect of collodio-bromide dry plates. I had the pleasure of showing you some negatives taken in the frost on old plates which had lain in the holder several months, and which you were pleased to admire. They were made on the recipe then promulgated by Colonel Wortley, saving that I substituted one drop of hydrochloric acid for two drops of nitric. The preservative used was Colonel Wortley's last, and an excellent one it is, though I as often use my own beer and pyro. I have said many times, and I say it still, that no dry-plate worker can desire a more reliable plate—amply rapid, very clear, and free from fog, and capable of any degree of intensity without trouble.

Colonel Wortley undertook the commercial preparation of his plates principally to answer all the queries, quibbles, and contentions which arose on their publication, and certainly without any view to pecuniary recompense, which I should think few individuals expect in such an undertaking, and still fewer realise (I hope Mr. Kennett may be more successful). But I am sure it would require a great number of *orders* to even neutralise the loss upon the experiments and the generous supplies of gratuitous plates which Colonel Wortley sent to his friends on every successive improvement; and I, for one, must avail myself of his published retirement to thank him as well for his valuable contributions to dry-plate working and for his invaluable discovery of strong alkaline development as for the urbanity, generous confidence, and unreserved communication throughout which he manifested to those friends who, like myself, became his friends by frank inquiry and free remark,

instead of provoking reserve, if not resentment, by the imputation of quackery or unworthy motives.

With the collodio-albumen process and its many beautiful results, so justly favoured by my dear old friends in the Manchester Photographic Society, I had not the time or the address to succeed to my content. But ever since the reading of Colonel Wortley's paper on a large excess of silver in the collodio-bromide process I have had one continued feast of delight and considerable success. I have had no desire to change that process for any other, and I believe that no more certain, rapid, clear, or dense plates can be *so easily prepared.* I therefore feel bound to tender my thanks to Colonel Stuart Wortley for all the time, science, skill, and liberality which he has bestowed on this branch of photography; and to express my hope that he may still find time and opportunity to pursue his researches, and be blessed with health and encouragement to render them as useful and as *uncommercial* as his heart has always desired them to be.—I am, yours, &c-,

*Hilgay Rectory, Downham, Norfolk,* St. Vincent Beechey.
*February* 16, 1875.

P.S.—With respect to my opinion as to the flickering of the triple-wick lamp, it was *at the bottom* and not at the top of the glass that I thought more air should be admitted. If a lamp cannot get a sufficient supply from below it will suck it in spasmodically from above. But of all the plain oil or paraffine lamps which I have seen I think none can beat the Silber lamp for lantern purposes. All the air is thrown on to the flame just *above the wick,* and the result is a most concentrated and splendid light, of perfect combustion.—St. V. B.

## THE SCIOPTICON AND TRIPLE-WICK LAMPS.

*To the* Editors.

Gentlemen,—I notice in your last issue another letter from Mr. Woodbury in reference to my last communication.

He begins by saying that I ask "your intelligent readers" to believe what he pleases to term "nonsense." Does he not see that he is himself asking "your intelligent readers" to believe in a thing that is simply impossible; he neither more nor less than attempts to prove that $2 = 5$. In other words, he tries to prove that two lights of a given size give more light than three lights of the same size; and not only that, but that the two lights give nearly double the light of the three, the size in each being the same! This bears such absurdity on the face of it that I really wonder if Mr. Woodbury expects anybody to believe it.

His last letter is not an answer to mine at all; he confines himself to repeating the useless experiment he made at first. His experiment of trying lights to be used *in* the lantern *outside* of it, or "flame to flame," as Mr. Winstanley puts it, I will now show to be inadmissible and utterly useless, for the following reasons:—

1. My lamp is not, and never was, intended for using in any other place but inside the lantern. When burning properly the lights are very small and white, the *whole* of the light being available on the condenser. I never intended it for house lighting. If I had, the flames would have been much larger, and it would have given a much better light tried by Mr. Woodbury's method.

2. The lights were not burning under equal conditions, as I have already shown. Notwithstanding Mr. Woodbury's assertion to the contrary, a lamp burning in a sort of tube *has* the light intensified in the directions of the ends of it, even though that tube be made of black iron.

3. The best light *in* the lantern is the worst light *out* of it. Take, for instance, common house gas. This is admittedly the best light for house lighting, and if tested for lighting power will hold its own against anything else; but put it in the lantern and we find it is the worst light we have for that purpose. On the other hand, take the lime light (which no common gas or lamp can approach for the lantern) and try it for house illumination; we should then find that any person would rather burn—say a dozen or two—common candles than it, while the value of the lime light for the lantern is equal to from 200 to 400 of such candles.

For these reasons, then, I hold that Mr. Woodbury's trial of my lamp *out* of the lantern is of no practical value whatever. I therefore decline to notice it further. Mr. Woodbury complains of flickering and unsteadiness in my lamp, and it is also noticed by the Editors. I freely admit that there is good ground for complaint in this matter. Owing to the hurried way in which these lamps were at first made the workmanship was not at all what I would have liked it to be. The cause of the flickering is owing to the mouths of the burners being too wide; this allows a little of the oil in the shape of vapour to come up irregularly between the wick and the side of the burner. This, then, is the cause of the flickering. It is not from any inherent defect in the lamp. It can be remedied by closing the mouths of the burners on the wicks with a pair of pliers.* I need hardly say that in the lamps lately made it is entirely remedied, and that they burn quite steadily.

In my last letter I put several questions to Mr. Woodbury, which he never even attempts to answer. I shall again put them, but in a very short and categorical manner, so that they cannot be misunderstood:—First: to prove that the sciopticon is equal to fifty candles, as he advertises it to be; or that it is anything else but what I originally put it—equal to forty-two and a-quarter standard candles. Second: to put the two lights on the screen together, using lenses of the same focus, and give the results. Third: he taxed me with copying part of the flame chamber of the sciopticon; does he say so still? Fourth: to give me the name of the gentleman who "suggested" and made the three-wick lamp previous to my doing so. Fifth: I now ask him to repeat my experiments in the same manner as given in my paper, and to show where my conclusions and figures are wrong. Till Mr. Woodbury answers these questions and repeats my experiments I most respectfully decline to answer any further communication of his on the subject.

I shall, however, have much pleasure in holding myself ready at any time to prove all I have claimed for my lamp, and shall be most happy if any gentleman will get up a meeting for the purpose of deciding this matter. I will not, however, be bound by any "back-door" trials with the lights; they must be put to their legitimate use on the screen. I was perfectly aware that Mr. Woodbury was not the inventor of the sciopticon, but he was the patentee, and still is the agent, for it in England.

In conclusion: a word to Mr. Cooper. I have not the slightest doubt that he may be pleased with the sciopticon. I have never yet said one single word against the lantern part of it, but, on the contrary, always praised it. Where Mr. Woodbury and I differ is as to its lighting power. If at the trial Mr. Cooper speaks of the lamp had been "adjusted" properly the result would have been different. Other parties have also tried the lamps together, with an entirely opposite result, as I can prove from letters in my possession. That I am not mistaken in my estimate of the lights I have already proved by trials with them in the presence of gentlemen whose names are a sufficient guarantee that I speak the truth.—I am, yours, &c.,

*Nicolson-square, Edinburgh,* J. M. Turnbull.
*February* 13, 1875.

* Since receiving this letter we have closed the aperture to such an extent as barely to allow the wick to pass up and down, but the flickering, we regret to say, still continues unabated.—Eds.

The Lady and the Bulldog.—Photographers have always been accredited with an unusually good allowance of temper, on account of the capriciousness of their sitters and the sudden changes of the atmosphere, which frequently cause them many an idle day; but they are not very often vexed by such an incident as occurred at Messrs. Vandyke and Brown's on Thursday, the 11th inst., in Bold street, Liverpool. The room was full of visitors waiting to be photographed, when a lady dashed in, accompanied by a huge bulldog panting with the unusual exertion of climbing four flights of stairs, and with his tongue hanging out. There was no consultation or second thought as to what should be done, but with one accord there was a rush to the door and a hasty leaving of the premises, Mr. Vandyke's indignation being better imagined than described.

Photographs by Lightning.—An American paper says that it may be as well to warn not only evil-doers but also respectable persons, male and female generally, to be careful what they are doing in a thunderstorm, or they may find themselves indelibly photographed by lightning on surrounding objects. A curious instance of this is to be found in a photographic gallery in Colorado Springs, United States, belonging to a Mr. Guernsey, where may be seen the photograph of the figure of a bear on a rock. The history of this "great natural curiosity" is as follows:—In the county of Bent, on the Purgatoire River, eighteen miles from Las Animas, Colorado, on the smooth face of a sandstone cliff, overhung by a wall of rock, a hundred or more feet high, was found this life-size photograph of a gaizzly bear. The picture is not an accidental resemblance to the animal, but a portrait more perfect and lifelike than any human art can supply. The short tail standing straight out, the ears visible, the mouth open, with eyes and teeth plainly to be seen, the attitude not constrained bnt perfectly natural, all demonstrate beyond the shadow of a doubt that the picture is a photograph stroke of lightning during the progress of a storm.

Hunted by Photographers.—The *Liverpool Daily Post*, speaking of Messrs. Moody and Sankey, the American revivalists at present in that town, says:—"Mr. Moody would like to keep photographers, as well as reporters, at arm's length. Evidently ranking the reporter's pencil and the photographer's camera among the worst inventions of a wicked world, he seeks—sometimes, I think, with more than saint-like vehemence—to deliver his speeches from the one, and his features from the other. Here, as in every place they visit, there is quite a run for Messrs. Moody and Sankey's likenesses. Tradesmen, whose sense of propriety and hankering after profits make them naturally desirous to bring the supply and the demand into some degree of harmony, consequently endeavoured to obtain a stock of the evangelists' portraits. In Mr. Sankey's case—because, uncharitable persons allege, he is good-looking—no difficulty is experienced; but, do what they like, photographers cannot induce Mr. Moody to 'favour them with a sitting.' It was the same in Birmingham, where, in answer to a polite request, he blurted forth in his usual stern manner something to this effect:—'No, sir; do you suppose that I'm to be hawked about the streets for sale by a set of ragamuffins?' The inevitable result is that,

while excellent likenesses are being sold of Sankey, the market is choked with what profess to be portraits, but are generally caricatures, of Moody. These caricatures are photographs of bad sketches taken by poor artists at the services. If Mr. Moody do not like them he has himself to blame. Of course, it would be intolerable to expect him or any popular person to run whenever a photographer calls—for John Bright was not far wrong when, in a recent letter, he described photographers as one of the sorest pests of public men—but it might be well to give a 'sitting' now and again, if only in the interests of truth, for thousands of photographs are being sold in Liverpool as likenesses of Mr. Moody which remind one more of a brigand than a powerful preacher of the Gospel."

## EXCHANGE COLUMN.

Wanted to exchange a new 5 × 4 mahogany camera, with folding back and focussing-screen, for a Fletcher's gas furnace for the vitro-enamel process.—Address, MORTEN DAY, 20, Terminus-place, Eastbourne.

Offers desired in exchange for half-plate dry camera and changing box, £5 (cost £10), Wheeler and Wilson's sewing-machine (cost eight guineas). Dallmeyer's 2B C.-D.-V. or landscape lens for 24 by 18 preferred. Other articles to offer.—Address, F. A., office of this Journal.

Portrait lens, whole-plate, by Hermagis, very quick and in perfect condition, divides into a landscape series of about eighteen inches focus, will be exchanged for a matched pair of Ross's instantaneous compound stereo. lenses. —Address, W. H. KIRKBY, 1, Manchester Buildings, Tithebarn-street Liverpool.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

P. A.—A *carte* lens of about six inches back focus will be the most suitable for your purpose.

W. W. S.—Tone the prints rather deeper. Let the tint be carried to the violet stage, and you will then obtain the result desired.

JOHN SMITH.—Of the journals respecting which you inquire No. 724 alone is in stock, the others not having yet been reprinted.

X. Y. Z.—The stains are caused by hyposulphite of soda which has been allowed to come in contact with the print previous to fixing.

OLD TOM.—The glass is altogether unsuited for glazing the dark room. It is of such a pale yellow colour as to transmit the actinic rays in great abundance.

Y. R.—The elimination of the acetic acid from the silver bath will prove a work of such difficulty that we advise you to precipitate the silver and redissolve it.

R. S. T.—If you obtained the consent of the sitter in accordance with the terms of the Act your copyright is good; otherwise it is worthless, and you will, if the case be proceeded with, have to pay all the costs incurred on both sides.

TRAVELLER.—It would be a most invidious task for us to give you the names and addresses of those we consider to be the best makers of apparatus. Moreover, where all are so good, consider what difficulty we should experience in fulfilling the task you desire to impose on us.

B. C.—You will find from the second sentence of the article that it is a translation from a foreign journal; and you will also find from that same sentence that we disapprove of the sentiments of the author. Surely you must have read (?) the article in a very careless and cursory manner.

E. S.—1. Apply for the unsensitised tissue; it will suit your purpose much better than the other.—2. The keeping properties of the sensitive "dusting-on" mixture depends upon so many contingencies that it is impossible to answer your question. By making one experiment you can determine the matter for yourself.

ZETA.—Full particulars of the Ferranti-Turner process were published at pages 431 and 516 of our volume for 1873. Any barrister who devotes his attention to the subject of patents will give you the desired information respecting the validity of this or any other patent. In reply to your third query, see a leading article in last week's number.

J. S.—The sample of methylated spirit forwarded to us is quite unfitted for burning. It contains a large proportion of gum, which has evidently been added for the purpose of enabling the vendor to sell it without a license. In this state it is known by the name of "finish." It will clog the wick of the lamp so rapidly as to render its use very unadvisable.

JAMES GREENWOOD.—Seeing that by the instructions an exposure of ten minutes to strong sunshine is required, the obtaining of the requisite effect by means of artificial lighting is practically out of the question. You may succeed by means of any of the numerous processes we have published in previous volumes of the ALMANAC and Journal, modified to suit your special requirement.

COSMOPOLITAN.—If you obtain a slip of perfectly pure india-rubber and place it at the bottom of the glass vertical bath, all danger likely to arise from the too sudden contact of the dipper with the hard bottom will be obviated. A small quantity of crushed or coarsely-powdered glass has also been recommended for the same purpose. You may avoid the danger of breakage by using an ebonite dipper, or one of glass having an ebonite end.

ONE PERPLEXED.—This correspondent wishes to know how to spot prints that are to be enamelled with gelatine. He finds that when he spots them with China ink the gelatine removes the spotting. Of course it will; hence he must use some other medium than water with which to mix the pigment to be employed in spotting. Let him grind up the pigment with fat oil of turpentine, or lavender, and he will have no more cause of complaint.

A LITIGANT.—No doubt whatever exists in our mind as to the illegality of the course pursued by your cousin. He never had any copyright in the portrait, and, what is more, he never by any means *could* possess such a copyright. It is true that he has entered the portrait at Stationers' Hall, but this fact, in such a case, possesses no value whatever, unless he had previously possessed the right to do so. Registration cannot of itself confer copyright.

S. FISHER.—To estimate the comparative degrees of rapidity of two lenses measure their diameters, or the diameter of the largest fixed stop, and compare with the focal length. The lens which has the largest diameter compared with its focus will be the quicker-acting of the two; but we state this on the assumption of the glass and workmanship being equal in both, for, we need scarcely observe, that a finely-polished and colourless lens will act better than one in which the glass possesses a yellow tinge.

G. DAVIDSON.—This correspondent wishes to know what form of burner [for the lime light we consider to be the best under all circumstances. The best of the very numerous forms we have seen is a small and somewhat unpretending one in our own possession, being either a safety or "blow-through" jet or a jet for delivering mixed gases at will. We have an impression on our mind that we have described it already; but if, on looking over some past volumes, we find that such has not been the case, we shall probably devote a brief article to it, because with regard to general convenience it will, we think, be found superior to those in use at the present time.

DUN-EDIN.—The most expeditious way by which to remove the varnish and collodion from old negatives is the following:—Place over a gas stove a vessel of any convenient form, such as a deep frying-pan. Fill this nearly full of water containing, in solution, a large quantity of washing soda. In another vessel place the negatives in batches of a dozen or thereabouts, face upwards, each separated from the other to the extent of about a quarter of an inch by the interposition of strips of metal or glass, or by any other contrivance. Let this vessel be filled with warm water. A third vessel is required, and this may consist of a large, flat porcelain bath, in preference to any other form. Now, by means of a pair of forceps, which must be sufficiently large to span across the plate, and the blades of which terminate with hooks, lift up the uppermost plate and immerse it for a few seconds in the boiling solution of soda, and then deposit it in the flat dish, where an assistant pulls or brushes away the now loosened film, and places the glass plate in a vessel of water to wash away the soda. By this mode a few gross of negatives may be cleaned off in a brief period. The old films must be put into a crucible, and the silver reduced to a button.

IN TYPE.—Communications from "Mark Oute," G. W. Webster, F.C.S. William Schmidt, and W. Hanson have been "crowded out" this week; also notices under the head of "Our Editorial Table."

THE FAR CATHAY.—We observe that Mr. J. Thomson, F.R.G.S., has been delivering a course of three lectures at the Liverpool Institute, on the *Far Cathay*, photography playing a leading part in connection with these lectures, which were illustrated by means of transparencies exhibited in the lantern. We have frequently on previous occasions adverted to these views in China, &c., which were taken by Mr. Thomson himself during a long course of travel through the Celestial Empire, Cambodia, &c. The local papers contain copious and most appreciative notices of these lectures and illustrations of scenes in the East; and as we understand Mr. Thomson purposes lecturing in several of the principal towns in the provinces, we recommend all our readers having the chance to spend an hour or two in visiting China and other oriental countries accompanied by a most intelligent guide in the person of Mr. Thomson, who can present and describe to his audience so many of the wonderful scenes presented to his view and caught by his camera during his wanderings.

## METEOROLOGICAL REPORT,

*For two Weeks ending February* 17, 1875.

Observations taken at 406, Strand, by J. H. STEWARD, Optician.

THESE OBSERVATIONS ARE TAKEN AT 8.30 A.M.

| Feb. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 4 | 30·00 | W | 33 | 34 | 42 | 33 | Cloudy |
| 5 | 30·31 | NE | 33 | 34 | 40 | 33 | Dull |
| 6 | 30·34 | NE | — | 29 | 42 | 27 | Foggy |
| 8 | 30·26 | SE | — | 32 | 34 | 30 | Dull |
| 9 | 30·16 | E | — | 31 | 36 | 29 | Dull |
| 10 | 30·16 | E | 33 | 35 | — | 30 | Dull |
| 11 | 30·17 | SW | — | 33 | 42 | 32 | Dull |
| 12 | 29·88 | W | 41 | 41 | 48 | 32 | Raining |
| 1 | 30·07 | E | 39 | 40 | 47 | 39 | Dull |
| 15 | 30·23 | N | 40 | 42 | 51 | 41 | Dull |
| 16 | 30·50 | NE | 38 | 39 | 42 | 38 | Foggy |
| 17 | 30·26 | NE | 39 | 40 | — | 35 | Raining |

CONTENTS.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 773. Vol. XXII.—FEBRUARY 26, 1875.

## THE PERMANENCE OF PHOTOGRAPHS PAINTED IN OIL.

That silver prints are liable to fade is a generally-received opinion; but, when an enlargement has been made, and painted in oil, it is as generally supposed that the production is as permanent as are the works of any of the old masters whose style is so often imitated. We have no wish unnecessarily to say anything tending to interfere with the confidence reposed in a style of art that is every day becoming more and more popular; but, in the interests of truth and of the photographic profession, we are constrained to utter a few words of caution against a practice which, if not checked, must ultimately end in bringing discredit on an increasing and valuable branch of photographic work.

However true to nature, and however well executed, a photograph may be there is a charm about a portrait in oil that will always command the attention of those who can afford to pay for it; and, as such a portrait may be painted on a photographic basis for a much smaller sum than is required to be paid in cases where no such aid is available, it is very natural that paintings on enlarged photographs should become popular. The result is that photographs printed on canvas and painted in oils are becoming a very important branch of professional work.

Now, it should be borne in mind that an artist of very moderate ability may make not only a very charming picture, but also etain in every particular the likeness of the original, provided he ıse only *transparent* or semi-transparent colour in his work—using, n point of fact, his paint sufficiently thin for the underlying photograph to show effectively through. After an examination of painted photographs from various parts of the country, we are constrained o say that this objectionable practice seems very prevalent; and it s not wonderful that it should be so. By the exercise of very little kill wonderfully beautiful effects can be produced, including a depth ınd richness of tone worthy almost of Titian; but, alas! a depth ınd richness of tone which will be found more fugitive than the most ınstable silver print, becoming in a few months a sickly, jaundiced-ooking thing, fit only to be turned to the wall. The truth is—and he public generally should be taught to know it—that there are few o-called painters who can paint on photographs well. In fact, a ıere colourist is altogether useless in this department of art; it equires a thoroughly-trained artist, who can bring to his work ime, patience, and skill, and by the use of solid paint produce a vork that shall stand the test of time, at the same time truly preerving the original likeness of his sitter or model.

What we desire to impress on the public is this—that oil-painted hotographs which shall be as permanent as the works of the old ıasters cannot be produced at a very cheap rate; and also to impress n photographers that they should only employ for such work artists f sterling ability. Low-priced works by men of inferior skill, lthough easily and cheaply done, can only end in disappointment ud discredit, as the thin transparent colour, though easily applied nd made to give results of great beauty, cannot stand the test of ven a very short period of time; but good solid body colour, used by n artist who is a master in his profession, although very much more difficult to manage, is in reality the only available material to form the foundation of this class of fine-art work.

It is sometimes said that oil painting is a "lost art;" but this is very far from being the truth. That many of the productions of our comparatively modern artists are giving way is only too true; but we have good reason to believe that in all such cases it will be found to have arisen from the fact that they have been painted in the thin transparent colour which it is the object of this article to discourage.

As the trade in painted photographs is one likely to increase, we earnestly urge the members of the profession generally to see that the work executed for them is done in strong body colour, and to keep in mind, when that is the case, that the likeness can only be retained by an artist of ability. In other words, commissions for painted photographs should only be accepted when the *honorarium* will enable the employer to place the work in the hands of an artist who thoroughly understands its character, and possesses the requisite ability to execute it in a proper manner.

## CAMPING OUT.

There can be no doubt that much more might be done in landscape photography than has yet been achieved if the practice of it were made more convenient and less expensive. This is especially true of Great Britain, where the climate is so very variable and uncertain, and living at inns during the season, in romantic localities, so very expensive. A photographer must now think many times, and count the probable cost of production of his negatives very seriously, before he sets out on a tour in this country with the common wet collodion process in the hope of making the trip pay. To spend several days at an inn during dull, wet, or misty weather, waiting for a gleam of sunshine at that particular hour when the particular view to be taken is properly lighted, is not only very annoying but very *expensive* work. Will the negative, when taken, be worth the money? Then, again: the tourist may be tantalised a hundred times a day, whilst sitting in a train and not in a position to use his apparatus, by the sight of the most charming "bits," or grand views of cloud and distance, or capital compositions of trees, brook, and mountain which seem made expressly for the camera. When *he* is ready there may be nothing to take; and when he is *not* ready a fine subject may turn up every ten minutes. The question with a landscape photographer must therefore be—first, to choose some locality where he is sure, from personal knowledge and observation, that fine subjects abound; and, secondly, to adopt some convenient and inexpensive means of getting at them and taking them at the proper moment and when they are lighted to advantage.

But the difficulty felt by a photographer is even more severely felt by a landscape painter. He must work rapidly under an umbrella or a tent, in the midst of wind, dust, and a hundred annoyances, and must in general commit a vast deal to memory, to be reproduced in his studio at home from hurried notes and sketches made under terrible disadvantages. Both the landscape painter and the landscape photographer seem to require a house upon wheels, in which they can not only work with comfort in any spot where work is to

be done, but also take their meals, sleep, and be altogether independent of other conveyances and also of inns.

We have been reading lately an interesting work, published nearly ten years ago, which treats directly of this subject, and from which we are certain that many landscape photographers would derive some valuable hints. It is by Mr. P. G. Hamerton—a gentleman well known in the artistic and literary world—and is entitled *A Painter's Camp*. In this amusing volume he tells us how he once lived alone, for some months during an inclement season, painting foregrounds, in a hut of his own contrivance, which was erected amongst the moors of Lancashire; afterwards, how he spent several months on an island on Loch Awe, under canvas, painting; also, how he painted on board of a curious boat, built for that purpose, and so as to hold his easel steadily. In the first chapter of the work he informs us how the notion of encamping developed itself. To quote his own words:—

"*First Form of the Idea.*—Something to shelter a painter from the wind and rain, and yet enable him to see. This led to the devising of a hut for shelter, with plate glass windows to see through."

"*Second Form of the Idea.*—Suppose the hut erected, somebody must sleep in it as a guard at night. It was a long way from home; if I slept in it myself I should be spared a long walk at each end of the day. This led to my sleeping in the hut."

"*Third Form of the Idea.*—The small troubles of life reminded me that servants are useful people. Accommodation for a servant was wanted. I devised a combination of tent and hut for him. This led to a transition from huts to tents; and now (1866) my camp is all of canvas."

But photographers in 1875 must manage better than this. An encampment of canvas tents would not suit their work at all, even supposing it to be in the centre of a locality where a hundred views could be taken. The best device for a landscape photographer would be, we think, a wooden house or van upon wheels. How, then, ought this to be planned? We will offer a few suggestions on the subject.

A photographic van or house upon wheels, for taking views, not portraits, should be drawn by two horses abreast, in order to be large enough for comfort. The horses should be hired for the job whenever it was necessary to move it from one place to another. The van should be upon four wheels and divided into three compartments. There should be a cabriolet in front with a projecting hood, like a "Hansom" cab, in which three persons could sit abreast—that is to say, two and the driver. Next to that should be the dark room, and, astern of all, the sleeping and cooking apartment, furnished with a stove and chimney. The photographer himself would sleep here, and his assistant in the front compartment, with the windows down, under the hood.

The van would be dragged to within an easy walk of some spot from whence several negatives could be taken, and when these had been taken successfully it would be moved to some other spot not less, perhaps, than five or six miles distant. In this way the whole of some fine neighbourhood might be conveniently photographed, whilst the expense of living at inns would be saved. The cost of living would not be, in fact, greater, if so great, as that of living at home. During bad weather negatives could be varnished, retouched, &c., and the diary of the trip be carried forward. On a trip of this kind it would be necessary to encamp in some rather solitary place—not too near a town or village, but close to a river or brook. A carbon filter would be an indispensable requisite, and some cases of desiccated milk, as well as potted provisions, biscuits, &c., would be taken. Cooking by charcoal, French fashion, would be the simplest and best, if charcoal could be procured.

The negatives would have to be taken in a common photographic tent, as it would not often be possible to take them in the dark room of the van itself. Mr. Sutton's moist process would be admirably suited for preparing plates on an excursion conducted in this way, whenever a slow exposure would answer. The van should be regarded as the photographer's "travelling house," in which he would travel about with all his paraphernalia close at hand, together with a comfortable dark room within a mile or two, at the furthest, of the subjects to be photographed. In this way a multitude of interesting "bits," "effects," "compositions," and "studies" could be taken of all sorts of subjects, which would have great value for artists. The attempt to drag a van to the immediate neighbourhood of *every* separate spot from which a negative is to be taken would involve much trouble and expense, and only end in the results with which we are already perfectly well acquainted. The "home upon wheels" is the new idea which we wish to submit to the reader as something far better.

We will conclude this article with an extract from Mr. Hamerton's book, showing what he thinks of the probability of landscape painters being able to derive aid from photography. He says at page 180:—

"With regard to photography in its relation to landscape painting, nobody has ever yet answered the often-suggested question how far photography may be useful to the landscape painter; and whether, under certain limitations, he may wisely practise it himself. Nor can I answer this question yet in any decisive way. I have hitherto only practised the waxed-paper process, and cannot speak authoritatively of the limitations of the wet collodion. Besides, I perceive that photographs taken for especial purposes as memoranda may be useful to a degree which, as yet, nobody has any idea of, for such photographs are not to be had in the market, where they would be unsaleable except to artists."

A word or two more about the van, and then we will discuss, next week, the taking of river and lake scenery. On this subject our author has some very curious and interesting remarks.

A van, or home upon wheels, or "*maison roulante*," as the French call it, would be a home at *any* season, even in the depth of winter; and an enthusiastic landscape photographer might live in it and make use of it all the year round. How very interesting winter scenery would be, taken in fine localities, amongst lakes and mountains, &c. Then, again, the van might be dragged to some sheltered spot on a grand sea beach, amongst gigantic rocks and cliffs, and instantaneous views of waves and clouds be taken from it, direct, whenever anything unusually fine of this kind happened to present itself. And what an infinity of studies might be taken for drawing-masters, to be vignetted and printed by the collotype process.

A van such as we describe might probably be built for from £60 to £80; and the photographer and his assistant, by living in it, would save at least £7 per week as respects hotel bills, and a vast deal more for carriage and breakage of apparatus. The comfort of this mode of practising landscape photography would be immense, and the results, we verily believe, such as could scarcely be obtained, except by an unlooked-for succession of happy accidents, in any other way. Be it understood we are now discussing *professional* and not amateur landscape photography.

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It will have been observed by those who are in the habit of burnishing their prints that the slightest stoppage, for even the briefest period of time, causes a mark across the picture, and that this mark is more brilliant and possesses a more polished surface than the rest of the picture. While experimenting in this direction, a few days ago, we tried the effect of passing the prints very slowly over the burnisher, so as to secure on the entire surface of the print the same high polish obtained on a limited portion when suspending for a moment the action of the roller. The experiment was very satisfactory, the gloss obtained on the albumenised surface by passing the print *once*, and slowly, through the press being superior to that secured by eight or nine such transitions when more rapidly effected. We advise such of our readers as burnish their prints to try this slow movement; and, considering the difficulty of securing a *uniform* slow motion, we suggest to the makers the propriety of adding the requisite gearing for obtaining a slow motion of the feeding roller when the crank handle is turned with a moderate degree of rapidity.

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## REMINISCENCES OF TWENTY YEARS AGO.

I am a great admirer of Mr. T. Sutton as a writer, and have often wished that I could throw off an article in his easy and natural style. Nevertheless, I am constrained to differ from him in sup-

posing that any part of the credit of discovering the collodion process belongs to Mr. Bingham. The honour of that discovery, I fully believe, rests solely with Mr. F. Scott Archer. It is a fact, however, that the collodion process has been greatly improved since Archer's day, and if it had been left in the state in which he published it, it could never have attained the popularity it now enjoys.

We are much indebted to Mr. E. A. Hadow, late of King's College, London, for his researches on collodion. He was the first to show the true chemical nature of pyroxyline, and to prove the existence of several definite compounds, some of which are soluble in a mixture of alcohol and ether, the degree of fluidity of the solution varying with the temperature of the nitro-sulphuric acid. Mr. Hadow was a photographer as well as a chemist; but he worked with short-focus lenses in a bright light, and did not determine anything worthy of record. His opinion was that the collodion was simply a vehicle for the iodide of silver, and that all collodions were alike, yielding a positive picture by a short, and a negative by a longer, exposure.

If I remember aright it was Mr. Henry Pollock, son of the late Chief Baron Pollock, who first drew my attention to the difficulty of preparing a good negative collodion. He assured me that the chemists were all in fault; and undertook to prove to my entire satisfaction that he could produce a better negative with collodions purchased in London, and prepared by a secret process, than any which I could make with Archer's or Hadow's formulæ. This challenge I willingly accepted, and repaired accordingly to his laboratory at the West End, well armed, as I thought, at all points. I had tried my collodions beforehand, at my own house on Highgate-hill, with a short-focus portrait lens, and they had worked well. Much, therefore, was I disappointed to find that in the London studio my pictures were a failure; and that whilst I was slowly and laboriously developing a feeble negative by repeated additions of silver, my friend had only to flood his plate with the pyrogallic acid, and a dense creamy negative was immediately obtained. The experiments of that morning convinced me most fully that I knew less than I had previously supposed.

Mr. Pollock was an enthusiast in the art, and, therefore, after enjoying a good laugh at my expense, he at once proposed that we should set to work to analyse the collodions. We therefore began by adding water to all the samples until the pyroxyline was thrown down, and then evaporated the filtered liquids to dryness on a water bath. The result was that the collodions prepared by Archer's and Hadow's formulæ left nothing, but the two purchased collodions left each a residue—the one very bitter and the other sweet. The sweet residue we soon determined to be grape sugar; but the bitter baffled us for the time. I took it away with me, and eventually made it out to be nitro-glucose.

You observe, in your memoir of the late Mr. Rejlander, that much of the milk of human kindness is still left in the world; and I often felt this to be the case in working with Mr. Henry Pollock. Every day at twelve o'clock our proceedings were suspended in order to administer a glass of port wine to the laboratory boy, who was supposed to be consumptive. I used to think that if he had any tendency that way it must be very slight, and that his master's pale face showed that he himself stood more in need of the stimulant.

For some time after the above I occupied myself in making a variety of experiments in my own laboratory with grape sugar and nitro-glucose added to collodion in graduated quantities. The results, however, were not very satisfactory, the grape sugar throwing the bath out of order by precipitating metallic silver, and the nitro glucose producing a smoky and inferior quality of negative. It struck me at the time that glycyrrhizine, or sugar of liquorice, might answer the purpose better, being easily soluble in alcohol and less likely to escape into the bath. I tried it and was much pleased, obtaining a warm brown negative easy of development. There was, however, a serious drawback, which, I believe, will be found to belong not only to glycyrrhizine, but to other organic substances of a similar kind—the high lights are apt to be *solarised* before the shadows are brought out; and not only so, but the collodion itself is gradually deoxidised and rendered insensitive, so that it cannot be kept long after mixing.

About this time, as far as my memory serves me, I worked with Mr. Roger Fenton, at the British Museum, copying casts and sculpture. He was anxious to render every assistance in his power, and used my collodions on large plates. He could not, however, overcome certain mechanical difficulties; for, however carefully the plates were coated, the upper part became dry before the lower edge was ready for the bath. To obviate this we added absolute alcohol, which retarded the drying, but, unfortunately, made the film so tender that it would not remain on the glass. I remember, as if it were only yesterday, Mr. Fenton saying to me, in a disappointed tone—"I am afraid, Mr. Hardwich, it will not answer; evidently a something yet remains to be made out."

There is a time for everything under the sun; and, says the inspired writer, they who seek will generally in the end find what they are looking for. After trying an incalculable number of experiments with resins, alkaloids, and other organic substances I suddenly hit upon the right thing in this way:—A communication was made to the Society of Arts in which the author showed that a sheet of paper so weak and tender that you could tear it easily with your hands acquired the strength and toughness of parchment by simply floating it for a few seconds on diluted oil of vitriol. On reading this my thoughts at once recurred to the British Museum, and to my unfortunate negatives washing away under a tap of water. I wondered whether I could impart a little more toughness to the film by "parchmentising" the paper before converting it into pyroxyline. I tried the experiment, and the results exceeded my most sanguine expectations; for, not only was the film very strong, but the negative developed with extraordinary facility, and showed an excellent density both in the lights and middle tints. The pictures, also, were very sharp and well-defined, as if taken with a lens of superior quality. Well then did I understand the feelings of that ancient philosopher who is described as jumping out of his bath and running along through the streets of the city exclaiming "I have found it!" What weary months of useless experimenting, and what grave shakings of the head amongst my friends, might have been spared me if I had sooner read that paper in the *Journal of the Society of Arts!* I solaced myself, however, with this reflection—that the patience of Job does not come naturally to us, but must be gained by exercise and cultivation.

If it were not for a fear of extending these reminiscences of olden times to an inconvenient length I might speak of Mr. F. Frith and his father-in-law, Mr. Rosling. Many most agreeable days did I spend at Reigate, and always with profit to myself. Mr. Frith had at that time a photographic omnibus replete with every convenience. His plates were so large that when I first saw him developing a negative it looked to me like a man balancing the top of a small table on his fingers and pouring a jug of water over it. I was curious to see whether he would ever get the developer back again into the vessel without spilling; but this feat he accomplished with much dexterity.

Mr. Frith was of great use to me in my experiments on collodion. He showed what was wanted for large plates, viz., a limpid preparation which would flow easily, and leave a film adhering tightly to the glass. The parchment-paper collodion, as I at first prepared it, was too contractile, and shrunk away from the plate unless the edges were roughened. This difficulty I removed by watering down the nitro-sulphuric acid until it produced the lowest of Hadow's compounds, the one next above xyloidine. Finding, also, that the trouble of parchmentising paper was considerable, I simplified the process by adding a large excess of diluted sulphuric acid to the nitro-sulphuric and immersing cotton wool, which was then parchmentised and converted into pyroxyline by one and the same operation.

I do not pretend to determine what the precise action of the sulphuric acid upon the cotton fibre in the stove process is; but evidently a part of the fibre is converted into sugar, because if you precipitate a collodion of that kind with water, and evaporate the filtered liquid to dryness, a small residue of nitro-glucose will be obtained.

Surprise was expressed by some persons that, being a public teacher in King's College, I should manufacture collodion commercially, as I afterwards did. It must, however, be borne in mind that I made no secret of the process, but published everything in the pages of the *Journal of the Photographic Society*. The object of the Council, therefore, in appointing me to the post I held was not interfered with. It was also remarked that, after having conducted the manufacture for a while, I gave it up rather suddenly. This seemed to imply that it had not proved successful; but an examination of my books would have shown to the contrary, for the value of the collodion made by me during the last year of my residence in London was nearer £2,000 than £1,000. My principal reason for giving it up was that my health completely broke down, and therefore I acted on the saying of the wisest of men, that "a living dog is better than a dead lion." Would that my poor friend Hadow had done the same. He was a man of superior mind and quite a genius, but he had not the constitution for real hard work. If he had left London and located himself for a dozen years in the strong air of the Durham coal fields as I did, I firmly believe he would have been alive to this day. But Hadow would not listen to the advice of his friends. He was a person of extraordinary self-denial and was always for punishing himself in some way or other. I remember his once saying to me

that he found he could do quite as much work on pure water as with a moderate amount of wine; and, eventually, he made the further discovery that animal food was not necessary, but that his head was clearer without it. What wonder, then, that in the impure atmosphere and close confinement of a chemical laboratory his health failed him. Not many years afterwards the Professor of Chemistry at King's College, Dr. W. Allen Miller, also died in his prime. Of him it is not too much to say that he was as remarkable for the integrity and uprightness of his character as for his scientific attainments. All who were privileged to know him entertain the deepest respect for his memory.

I must try at some future time to send you my reminiscenses of "photographic printing" in its first and early stages.

T. Frederick Hardwich.

## NOTES FROM THE NORTH.

A few words in my last batch of notes about Mr. Turnbull's three-wick lamp seems to have raised a commotion that should be somewhat authoritatively set at rest. The question is not one in the interest of any particular lamp or maker, but in the interest of truth, and is, I think, a question which can be very easily settled. I have little faith in the photometric experiments of amateurs, and hardly think the readers of the Journal would be satisfied with the results at which they might arrive. Anxious, however, to ascertain the truth I applied to Mr. John Reid, the well-known manager of the Edinburgh and Leith Gasworks—a gas engineer of world-wide reputation, and one whose practice in gas-testing renders him peculiarly fitted for the office of referee on any question connected with the value of light. He kindly agreed to examine and report upon the value of the triple and sciopticon lamps. I have much pleasure in publishing his report, and have no doubt it will be accepted by all concerned as conclusive:—

*Edinburgh and Leith Gas Light Company's Office,*
11, *Baltic Street, Leith, February* 17, 1875.

Dear Sir,—I have this day made a very careful experiment by means of Bunsen's photometer for ascertaining the actual and relative intensity of light transmitted by two sciopticon lanterns—one containing the ordinary lamp with two wicks, the other containing a lamp with three wicks, both burning paraffine oil, the lights in each experiment being compared with the standard sperm candle in use for gas-testing, and burning at the rate of 120 grains of its weight per hour.

*Experiment I.*—The *triple-wick* lamp, being carefully trimmed and lighted, was placed at one end of a photometric scale with the outer surface of its condenser exactly 100 inches distant from the standard candle at the other extremity of the scale—the relative light thrown on the Bunsen shadow screen being balanced at ninety inches distant from the condenser, and ten inches from the centre of the candle. Therefore $90^2 : 10^2$ gives the illuminating power of the lamp as equal to eighty-one candles.

*Experiment II.*—Removing the condenser and bringing the centre of the lamp flame at the 100-inch point, the light of the lamp thus exposed to the screen was equal to 20·25 candles.

*Experiment III.*—The two-wick lantern, being put through precisely the same tests successively as with the *three-wick* instrument, gave the following results:—

With the condenser placed as in experiment I...87·7 candles.
Without the condenser, as in experiment II..19·5 ,,

It appears, therefore, that, while with the naked flame the two lamps do not differ to the extent of one candle, the difference in favour of the two-wick lamp *with* the condensers is equal to nearly six and three-quarter candles. This discrepancy seems to arise from some difference in the focal distances of the respective condensers, and probably there is a range of scale different from 100 inches at which, from this circumstance, the three-wick lamp would show better relative results.—I am, dear Sir, yours truly, John Reid.

Dr. John Nicol, *Edinburgh.*

If the lamps are to be tested in the lanterns with the light passing through the condensers, then both condensers must be of the same focal length. In the case in point they were not so, that of the triple lamp being much shorter. This, of course, caused the rays to diverge at a much wider angle, and so gave a much smaller apparent illuminating power. The sciopticon lamp would not burn out of its own lantern, and the triple lamp would not go into the sciopticon, and therefore trying them under similar conditions was impossible. The examination of the naked lights, however, is in every way satisfactory, and I hope we shall hear no more about the matter. I may add that the lamps were most carefully managed, and both were burning at their very best.

I was a little surprised at the result—a difference of less than a candle in favour of the triple—as on a trial in two lanterns, in the presence of a number of gentlemen well acquainted with lantern work, when the discs were made equal in size on the screen, it was the impression of all present that the triple lamp gave a light more in quantity and much whiter or purer in quality. The photometer, however, has no notions or opinions; it simply tells the truth, and as such I accept it.

In an article in The British Journal Photographic Almanac a contributor says "to those about to buy a secret process—Don't." By way of proof of the soundness of the advice let me tell my readers that, when on a visit to the studio of one of our provincial photographers a few days ago, he handed me an envelope, for the contents of which the payment of the modest sum of two guineas was expected; it purported to teach how the exposure in the camera might be shortened by one-half. They will hardly believe me when I tell them that the precious secret consisted of the advice to hold the plate for a short time close to a dull gas flame; or, if that did not happen to be handy, an exposure of six-and-a-half seconds to the flame of a palmatine candle would do the job. I hope they will appreciate the exactitude of the odd half second, and be sure that they manage to secure the true palmatine article. Surely, in the face of what has been published in the journals during the past year —— but, no! I shall forbear to express my opinion with regard to the transaction, except to say that, after such an exposure, if anyone will spend hard-earned money in such folly he shall, at least, not have my sympathy.

Photographers often say, in excuse for flat, hard pictures, that the public want them and will have them. This I have always doubted, and recently met with an admirable illustration of the truth of that opinion. On a recent visit to a little manufacturing town some sixty miles from Edinburgh I called on the two photographers which the place possessed. The first I found in rather a desponding mood. He told me that he started years ago in S——, but, after struggling for three years, could not make it pay. He then tried F——, but with no better result; and, after four years in the present locality, he was just as far from success as ever, adding—"I'm sure it's no fault of mine, as I carefully try to find out what the sitters want, and do my best to please them." I ventured to suggest that hard, under-exposed pictures, with faces into which not a trace of shadow entered, was scarcely likely to make a good reputation, and offered to take a portrait of himself, just to show what I thought he ought to aim at. "Bless you!" he exclaimed, "I know all about the style of thing you mean, but if I were to turn out such high-class work as that I should never see a sitter in the place! Nothing but white faces will go down, and, even of them very few come my way."

The other photographer seemed altogether of different metal. He had been over twenty years in the same place, and had "found photography a very good friend." His studio had been built by his own hands, and altered from time to time as his knowledge of the requirements of good work advanced. He said he knew little of art when he began; but he had laid his friends under contribution for engravings, and carefully examined all the good pictures to which he could get access, and thought if he tried to keep as near the best of them as he could he should not go very far wrong. In reply to a question as to the tastes of his customers, he said—"I have always felt that I knew more about the matter than they did, and from the first made up my mind never to let a picture out of the place unless I was satisfied that I could not do better." He admitted that he had now and then lost a customer by refusing to study their whims, but was sure that for one such loss there had been a score of gains; and he showed me a row of handsome villas he had built as a proof that his system had, at least, paid him well.

Let my readers follow his example, and educate themselves—first up to the knowledge of what constitutes a good picture, next thoroughly overcome the difficulties of how to take it, and then educate their customers up to the proper appreciation of such work. Although they may not, in these days of excessive competition, be able to build a street of handsome villas, I can assure them that they will find the system both pleasant and profitable.

Most photographers are aware of the trouble connected with making copies from card or other pictures, and the generally unsatisfactory nature of the results. When chatting with a friend, a few days ago, who has for some time done a large trade in this line, he called my attention to a number of really good prints he was just getting ready to post; and I confessed to being somewhat sceptical when he stated that they were all from *carte-de-visite* prints, and some of them not by any means good. In reply to a question as to how it was done, he said it was a well-known method, but as it looked somewhat complicated he supposed it had been tried by very

few. It consists, simply, in taking two negatives exactly similar, and printing through both at the same time. By this means the offensive granularity so often visible in such copies seems to be altogether got rid of, and prints quite equal to those from negatives taken direct are easily obtained. This, of course, has been published before; but, like many other good things, it has, I suspect, been overlooked, otherwise the operation of copying would have met with more general favour amongst the brethren. Will some of them give it a trial? I am sure there will be plenty to do, if the public can once be convinced that good copies can be got from *cartes*, or from other pictures of which the negatives are no longer in existence.

I see that many photographers do their retouching with water colours, and frequently complain that it often adheres to the surface of the paper during printing, when, of course, it, along with a portion of the film, is torn away. Let those who so suffer try oil colours. The most judicious and successful retouching I have seen was by Mr. Bashford, of Portobello, and that is the material he uses. He says it is easily applied, dries perfectly in a few hours, and may be hastened by a smart heat before the fire. Since its adoption, he has never lost a negative by it, and likes it infinitely better than either water-colour or pencil. JOHN NICOL, Ph.D.

## FOREIGN NOTES AND NEWS.

DR. JULIUS SCHNAUSS ON THE INFLUENCE OF THE SUNLIGHT ON THE COLOUR OF CERTAIN MINERALS.—THE PHOTOGRAPHER IN THE LYBIAN DESERT.—DR. VOGEL ON THE VARYING SENSITIVENESS OF SILVER SALTS UNDER THE INFLUENCE OF DIFFERENT NEUTRAL BODIES.—FIRST EXHIBITION OF THE BELGIAN PHOTOGRAPHIC ASSOCIATION.—ELECTRICAL TINDER BOX.

THE alchemist of old believed that the sun shining upon certain precious stones deprived them of their colour. The beautiful grass-green, opaque chrysoprase, when long worn in a ring or other trinket liable to be exposed to the light, at last lost its colour, which, however, could in a great measure be restored if the stone were wrapped in cloths steeped in wine and then stored in a cellar. Though the latter part of this curious statement be pure phantasy, yet we are assured that the first part is sober truth.

Dr. Julius Schnauss, in an article on *The Influence of the Sun's Rays on Certain Minerals*, gives as an instance an emerald worn by himself for seven years, and whose colour has disappeared. He says that curiously enough the hardest minerals seem to be most sensitive to the action of light, the maximum degree being reached in the diamond. Indeed coloured diamonds are said to be sometimes almost as sensitive to light as chloride of silver. Be that as it may, the following experiments are vouched for by Dr. Schnauss.

If a coloured diamond be made red-hot the colour will generally disappear for ever. This method is occasionally employed by diamond merchants for improving the value of their goods. Sometimes, however, the heating only changes the colour, and sometimes exposure to the sunlight brings back the original colour. A diamond merchant, named Mr. Martin, heated a diamond to get rid of a brownish colouring, but the stone became a rose red. Another became red when looked at in the dark room, but after a few minutes' exposure to daylight it became brown. Another dirty-yellow diamond was made red-hot in a stream of hydrogen gas in a porcelain tube, and allowed to cool before being removed. The colour had vanished, but not the sparkle; yet seven minutes' exposure to the light sufficed for the recovery of the original colour. This experiment was repeated, the diamond being heated in chlorine gas, saturated with benzoic fumes, then heated by mercury, the diamond being enveloped in a thin plate of platina. Each time the colour vanished, and remained absent until exposed to light.

This phenomenon has probably some connection with the phosphorescent peculiarities which some diamonds show when exposed to a strong light.

The Berlin Photographic Society has received some photographs taken in the Lybian Desert by Herr Remelé—a member of the expedition sent out by the Viceroy of Egypt. The photographs include botanical studies, views in the garden of the oasis of Chargeh, picturesque bits in the rocky wilderness of Dachel, and views of the disinterred temple of the oasis of Chargeh. We hope soon to be able to say something about Herr Remelé's journey.

In an interesting paper Dr. Vogel gives an account of some recent investigations of the cause of varying degrees of sensitiveness in photographic plates. Numerous observations have substantiated the fact that the sensitiveness to light of photographic bromo-iodised silver plates is considerably increased by the addition of nitrate of silver, nitrate of mercury, morphia, pyrogallic acid, tannin, and similar substances. This increase is sometimes caused by the capacity of the substance introduced of fixing the iodine; at other times it originates in its power of absorbing the light. Pyrogallic acid, for instance, may now accelerate, now delay, the action of the light, even when employed in a form in which it either absorbs the light or lets it pass through. A solution of pyrogallic acid on iodised silver plates reduces the sensitiveness of the latter, yet renders it transparent; but if the solution be allowed to dry in, the transparency decreases and the sensitiveness of the plate is considerably increased by the pyrogallic acid coating.

It is noteworthy that certain sensitive films of bromide of silver act differently from those of iodide of silver and iodo-bromide of silver. This was first observed in the case of morphia. A solution of one grain of morphia in 1,400 grains of water acts as a powerful sensitiser on bromo-iodide of silver; that is, the sensitiveness of the latter to green and yellow rays is considerably raised, as has been proved by experiments with the spectroscope. With bromide of silver, on the contrary, no such accelerating action is remarked, either in taking common objects or by spectral researches. Similar negative results are furnished by the action of pyrogallic acid on bromide of silver.

Nor are these isolated instances. For example: fuchsine makes bromide of silver very sensitive to yellow, so that the action of these rays in a long exposure is far greater than that of the blue rays; while on chloride of silver the effect is quite different, as with a short exposure there is no increased actinic power on the part of the yellow rays, and with a long exposure the increase is much less than with bromide of silver.

From this one may see that it is unsafe to draw any inference as to the action of an accelerator upon one silver salt from its effect upon another of these salts.

The explanation of this abnormal circumstance is to be sought for in the laws of physics rather than in those of chemistry. The plates are actually affected only by the rays they absorb. The degree of this aborption is determined, not by the independent action of the sensitiser, but by its power of co-operation with the chloride or bromide of silver. Substances in themselves indifferent acquire in this way a manifest influence over the result. Thus, fuchsine dissolved in alcohol absorbs only yellow and yellowish-green rays; in ether or collodion it absorbs orange also, so that fuchsine added to bromide of silver is sensitive not only to greenish-yellow, but also to orange. Again: chloride of silver is less sensitive with fuchsine added. This may be because the latter salt modifies the absorbing power of the fuchsine.

Further researches into this subject are in progress. So far it has been ascertained that it is a mistake to believe that a preservative which is suitable for iodised silvered plates is necessarily suitable for bromide-of-silver-coated dry plates.

There is to be a photographic exhibition held this summer in Brussels by the *Association Belge de Photographie.* It will be held in the large *salle* of the *Cercle Artistique et Litteraire*, and will be opened on July 15 and closed on September 15. Full particulars can be obtained from the Secretary, M. Rommelaere, No. 44, Rue de Namur, Brussels. Works intended for exhibition must be sent in before June 10th. Medals and honourable mentions will be awarded by a jury composed of eleven members, five of whom will be foreigners. Exhibited works will include new and useful apparatus, and pictures by the following processes, viz.:—Heliographic engraving in relief and intaglio, heliotype, Woodburytype, photolithography, carbon prints, photo-enamels, and silver prints upon albumenised paper—the last and least-esteemed on the list, possibly, for this Association has constituted itself the special champion of permanent printing. The rules of the exhibition appear to be very sensible and good.

It is gratifying to find a young photographic society like the above, founded in a comparatively small kingdom, conducting its affairs in so spirited a manner, publishing every month a journal of its proceedings, beautifully illustrated by a photograph in carbon or printing-ink, and about to hold its first annual exhibition. May success attend it! and may photographers in our own country gather from it some useful hints as to how to manage the affairs of a photographic society in any case where such management has hitherto proved a failure!

We have omitted to state that the above exhibition will be held under the patronage of the King.

M. L. Moock has just published a treatise on printing photographs in fatty inks. It is divided into three parts. Parts one and two relate to the process employed and recommended by the author him-

self. Part three contains a description of the processes of Woodbury, Edwards, Albert, &c., not one of which the author considers as good as his own. The work is published by M. Audouin, at Paris. (See his advertisement in The British Journal Photographic Almanac for this year.)

An electrical tinder box has just been invented in France, which will perhaps in time supersede lucifer matches. It is small enough to be carried in a cigar-case. A platinum wire which stretches across the box becomes red hot when a spring is touched, and any combustible placed in contact with this red hot wire is instantly ignited. The wire is heated by a small electrical battery, which is set in action when the spring is touched. The cost of this new tinder box is only half-a-franc, and its use is said to be more economical than lucifer matches.

## FREDERICK SCOTT ARCHER.

In order to be able to adequately appreciate the services rendered to our art-science by Mr. Frederick Scott Archer we must bestow a glance at the position of photography prior to the period when he made public, through the pages of the *Chemist* (a journal which has long ceased to exist), his famous discovery of the collodion process. Let it not for a moment be understood that he was the inventor or discoverer of collodion, for such discovery followed very soon after Schönbein's introduction of gun-cotton, one property of which was found to be that it was soluble in sulphuric ether, which solution, when spread out upon the skin, left a film the particles of which were found in close adhesion. Shortly after its discovery gun-cotton was extensively employed in surgery as a covering for abrasions and wounds, the designation "collodion" being applied to it from a Greek word signifying to stick or adhere. It is not to be wondered at that such a material should have attracted tbe notice of more than one experimentalist in photography; hence, as we shall show, Le Gray, as well as Archer, tried it—with what comparative results will be seen.

Previous to the discovery of the collodion process by Archer the production of portraits was confined to the Talbotype paper process and the daguerreotype. By the former, portraits possessing great vigour and undoubted merit, although devoid of delicacy, were obtained; by the latter, the results secured fulfilled the highest requirements of sharpness and delicacy. There existed, however, a very important distinction between these two processes; for by the former the camera picture was a *negative* capable of yielding an unlimited number of prints, while by the latter method each picture was complete in itself and lacked the power of reproduction.

Mr. Archer, who was at this period a sculptor in Tavistock-street, became enamoured, like many other men devoted to philosophic research, of the young and fascinating science of photography, and had entered into its study with a degree of spirit and enthusiasm rarely witnessed at the present day. He had been trying numerous methods of improving the surface of negatives, and was aware of Le Gray's suggestion of collodion for this purpose. But his aim eventually was not merely to improve the surface of paper, but to do away with paper entirely; and when, in the presence of his friend, Mr. W. J. Taylor, the well-known medallist, in Red Lion-street, he tried ineffectually to get a collodion film removed from the glass plate upon which it had been formed, he made a merit of necessity, sensitised and exposed the film while it was still attached to the plate, and produced the first collodion picture ever taken upon glass. He rapidly perfected the process, and, upon subsequently apprising his friend, Mr. Taylor, that he was about to publish it to the world, was strongly recommended by that gentleman to first of all secure it for himself, in order that he might receive a small portion of that wealth which was seen to lie in the process and to which he was so well entitled; but, heedless of this prudent advice, he gave the discovery to the world. We are, however, anticipating. As the outcome of his various experiments he published in the *Chemist* of March, 1851, the now well-known collodion process, and in the following year issued the first manual of that process, which it is impossible to peruse at the present date without having our wonder excited by the measure of perfection to which the process had been brought before it was thus introduced to the public.

The previous suggestion of collodion, among several other substances, by Le Gray, as a probable useful material upon which to take photographs does not in the least detract from the credit to which Archer is so well entitled for having worked out his beautiful process. That he may have received occasional suggestions from his associates at the time—from such men as Dr. Diamond and Mr. Morgan Brown—and acted upon them there is no reason to doubt; but these gentlemen are the very last to seek to withhold from Archer the great merit due to *the* discoverer of the process by allowing any portion of such merit to be diverted from Archer to themselves.

So short a period has elapsed since we had occasion to weigh and dismiss the rival claims set up on behalf of Le Gray and Bingham against those of Archer that comparatively little remains to be said. We have already stated that Archer gave us the collodion process pretty nearly as now practised. Previous to his researches pyrogallic acid was unknown as a photographic agent. It were folly here to refer to the position it now occupies in the development of plates, and the great power it exerts over the well-nigh extinct gallic-acid developer. In the first edition (March, 1852) of his manual, referring to the development of the image, he says:—"There are many chemical salts possessed of this power of reducing the salts of silver, when in solution, to the metallic state. The salts generally employed are pyrogallic acid, protonitrate, and protosulphate of iron. The great power shown by pyrogallic acid in bringing out the latent image was first made known by me in a short description in the May number of the *Chemist* for 1850. I then pointed out a method of using it so as to produce an exceedingly sensitive surface. In that formula, however, acetic acid was the solvent both for the nitrate of silver and pyrogallic acid solutions. Even then its action was very energetic, requiring no after-wash to bring out the image; it is also equally rapid when used in connection with a surface of albumenised glass." Then follows his more recent formula of three grains of pyrogallic acid to the ounce of water, which, equally with the proportions—thirty grains to the ounce—of his nitrate of silver bath has not been greatly, and in some cases not at all, departed from at the present day.

Who is there now unaware of the beauty and pearl-like delicacy conferred upon a collodion positive picture by subjecting it to the bleaching action of bichloride of mercury, thus converting it into what has since been felicitously termed an "alabastrine" picture? It is described by Archer in the following terms:—"Prepare a saturated solution of bichloride of mercury in muriatic acid. Add one part of this to six of water. Pour a small quantity of it over the picture at one corner and allow it to run evenly over the glass. It will be found immediately to deepen the tones of the picture considerably, and the positive image will almost disappear; presently a peculiar whitening will come over it, and in a short time a beautifully-delicate white picture will be brought out." The only difference between the original formula of Archer here given and those most recently published consists in the addition of a few drops of alcohol to ensure the liquid passing evenly over and penetrating the film, and also a drop or two of nitric acid, which some assert to be beneficial, but this is denied by others.

Again: who is not aware of the process of intensifying negatives by means of mercury and hyposulphite of soda, so much in use at the present time for many purposes in connection with photography? To Archer, also, are we indebted for this. He describes in the manual to which we have already referred how a collodion picture previously treated with mercury may be converted into "a deep-toned negative, many shades darker than it was originally," by pouring over the surface a solution of either hyposulphite of soda or of ammonia. He says:—"It is singular that the picture can be alternately changed from a white positive to a black negative many times in succession, and very often with improvement. Thus by the above process," he continues, "a most perfect white positive or a deep black negative is produced, quite distinct from each other."

Among the various inventions and discoveries made by Archer may be mentioned his camera, which contained baths, dishes, and all the chemicals and appliances for working the wet collodion process out of doors. A camera in which to manipulate a plate ten inches square may be thus described:—It comprises a wooden box eighteen inches long, twelve inches wide, and twelve inches deep, with a sliding front to admit the lens. The two sides have openings cut in them in which sleeves of india-rubber cloth are fixed to admit the hands of the operator; these sleeves terminate with elastic bands which press against the wrists to prevent the admission of light. The back of the camera has a hinged door fitted at its upper part with an opening of just sufficient size for the eyes, and shaped so as to fit close to the face. A black cloth is tied round this end to prevent any ray of light penetrating at such opening. In the top of the camera, near the front, is inserted a piece of yellow glass to admit a small quantity of yellow light, and is closed with a hinged door to regulate the quantity of light required. The interior is furnished with a sliding frame to support the ground glass, or bath and pre-

pared plate, and the range is such as to allow of any focus from three to fifteen inches. There are also drawers and shelves for bottles. Archer so constructed his camera as either to allow of the plate being exposed while it remained in the bath—the face of which was of polished glass—or it could be exposed by itself after its removal from the bath. From the foregoing description, given in outline, it will be seen that Archer was also the pioneer of our modern makers of tents or developing-boxes. We have seen many of Archer's pictures taken in such a camera as that here described, and can vouch for their great excellence.

The removal of collodion negative films from glass has recently received a great amount of attention, owing to the advantages arising in many printing processes of placing the reverse side of the negative in contact with the sensitive surface to be printed upon. Here, again, was Archer first in the field. A method, which he introduced and patented of employing a solution of gutta-percha for this purpose was very successful. A solution of this gum in benzole was applied to the negative, and, when dry, was placed in a vessel of water, by which the negative pellicle became detached from the glass.

Since we recently had occasion to defend Mr. Archer as an optician against the attack of Mr. Sutton, we have examined more carefully than before the Archer fluid lens in our possession, and are more than ever struck with admiration at its excellence. It is a portrait combination of the doublet or compound form, and is quite aplanatic, for it works with full aperture and produces a sharp image. It is very singular that it possesses one feature in common with the very latest "new" lens yet introduced—that of Steinheil, which has elicited so much correspondence—namely, the back lens of the combination is of much shorter focus than the front lens. We need scarcely say that in all the portrait lenses now in use the front combination is more powerful than the back; but in Archer's objective the focus of the front is twenty inches, while that of the back is fourteen and a-half inches—the diameter of this latter lens being two inches and five-eighths. The *back* focus is seven and a-quarter inches. From these *data* it will be seen that Archer was really very advanced in his optical knowledge. Archer's lenses bear testimony to his manipulative skill as an optician; that he was a "mathematical optician" we had long felt convinced, and are gratified at this being borne out by Mr. Brown's statement, subsequently given in this article, as to his having examined the computations relative to the curves of the various lenses made by Archer.

THE LATE FREDERICK SCOTT ARCHER.

FROM A PHOTOGRAPH BY MR. BARNES.

Archer, if we are correctly informed, was born in Bishop Stortford; his family certainly belonged to that place. We have said he was a sculptor. He was at first apprenticed to a silversmith, then took to modelling for the trade, and eventually became a sculptor. Many excellent busts were modelled by him, among which were those of the Marquis of Northampton, Lord Albert Conyngham, William Smith (of the National Portrait Gallery), and other men of eminence. He was a man of very obliging disposition, always ready to devote the utmost amount of attention to the explanation of the new process to those who were likely to appreciate it. He was not physically strong, as he suffered much from enlargement of the liver.

We have referred to Mr. Morgan Brown (patent agent, Southampton-buildings) as one of Archer's intimate acquaintances. He has kindly furnished us with some notes respecting Archer which we here give. "Archer's first practice in photography," says Mr. Brown, "was with paper with which he worked out the pyrogallic. His paper camera was constructed on the principle of working in it. I have a very imperfect copy of a picture taken by him in 1850, *Corner of Mill Lane, Ewell.* Perhaps Archer took the idea of collodion from Le Gray's pamphlet, wherein the latter mentioned the use of collodion to improve *the surface of paper.* The conception of applying the film to glass was *Archer's own*, and was known to, and worked at by, him very early in 1850—Michaelmas Day 1850. My desire to know something of photography—having seen Archer at Ewell practising the paper process—induced Dr. Diamond to ask Archer to meet me at Wandsworth Asylum on Michaelmas Day, 1850. There Archer brought some collodion in a bottle and some solution of silver. I had brought a lens of eighteen inches focal length, and a box with a back door. The lens—an achromatic meniscus—screwed on the front. Archer then showed this collodion, I believe, for the first time to anyone excepting, perhaps, Mr. W. J. Taylor, of Red Lion-street. He poured the collodion on a piece of glass about three by four inches, sensitised it in the nitrate of silver in a plate, put a picture of a house front on it, exposed it, and developed it into a picture. That picture I placed first in a book, the film being detached from the glass, and subsequently placed it for preservation between two plates of glass; but I have either lost it or given it to Dr. Diamond. Archer, the same day, tried to expose a plate in my camera; a faint image of a tree was the result. I then began working at collodion, continually seeing Archer, and in March, 1851, Archer published his account of the process in the *Chemist*, though he had plenty of pictures made in the autumn of 1850. Mr. Peter W. Fry's acquaintance with the process was, I believe, after the publication in the *Chemist* in March. Archer's first idea was to use only one piece of glass and always transfer the film, entirely copying what he did. I did, on the 5th May, 1851, make four views of *Eversham Church, Surrey*, from *one* piece of glass, rolling up each view in wet blotting-paper. One of these views, transferred to another piece of glass and *fixed* at home, I have now. Nothing but salt and water was used after development, just to stop the action, all other work being done on returning home. Except the incidental mentioning of collodion by Le Gray, I do not believe another person has any share whatever in Archer's discovery; and, as I was particularly sensitive at the time to everything published, I do not believe any authentic information can be brought to controvert the dates here given by Le Gray, Bingham, Fry, or anyone else. Pyrogallic acid as a developing agent, the practical application of collodion at all and *entirely* on glass, the bichloride process, and the working camera are, I believe, solely Archer's. The latter was in use by him long before collodion. Archer's fluid lens was, I think, first commenced by him for the object glasses of telescopes. I have seen quires of paper covered with figures and formulæ, working out his calculations about the curves, &c., of his lenses."

Archer, as we have said, did not enjoy robust health. It was, perhaps, natural that he should feel dissatisfied when enormous fortunes were being made by others through the instrumentality of his discovery, and that no energetic steps should be taken to remunerate him. Steps were, however, being taken in recognition of his services when he died in May, 1857, at the early age of about forty years, leaving a widow and three children. Mrs. Archer, a devoted wife, very soon followed her husband; and through the generous action taken by many photographers, a sum, of which Her Majesty contributed twenty pounds and the London Photographic Society fifty pounds, was obtained sufficiently large to secure the education and personal comfort of Archer's three orphan daughters.

In conclusion: let us pause to consider what an enormous fortune would have been realised by Archer had he secured, as Mr. Taylor suggested, the collodion process by patent. Collodion portraiture became a necessity; it was practised by tens of thousands in every town and village both at home and abroad; fortunes were made in a brief period of time; and yet the last moments of the benefactor of such a large portion of the human race must necessarily have been rendered far from pleasant by the thought that he was leaving his family almost destitute, notwithstanding the consideration that indications were being made of a movement on his behalf, too long delayed. Let us honour the memory of such a man.

The portrait from which our engraving is made was taken in Archer's studio, in Great Russell-street, by Mr. Barnes, of Mile End-road, when on a visit to Archer to acquire a knowledge of the collodion process. It is said to be an excellent likeness.

## Our Editorial Table.

### Wilson's Lantern Journeys.

Philadelphia: Benerman and Wilson.

We have had frequent occasion to call attention to the importance of having each photographic or other view, when exhibited to an assemblage by the agency of the lantern, accompanied by a few words of intelligent description or comment, and the necessity for this is now being so well recognised as to induce many authors to supply the acknowledged deficiency. The advantage of a short, pithy, bit of chat about each picture as it is presented to the eye is too obvious to require comment here; without such a description the picture fails entirely in its educational intent, and becomes totally uninteresting save in its flitting before the eye as a mere pretty picture, and nothing more.

When we recently reported an "Evening with the Benevolents" we adverted to the shortcoming in this respect then felt, and in so doing we hinted at the existence of the volume now under notice, and culled from its pages an appropriate extract. The *Lantern Journeys* of Mr. E. L. Wilson, of Philadelphia, is a compendium of information relating to leading features in many parts of the globe compressed into the smallest possible compass. In these "journeys" we find, in brief paragraphs, interesting information concerning the series of slides which they are intended to explain, the various subjects being almost cosmopolitan, embracing continental, Indian, English, Scotch, and American views. From the specimen we gave of these miniature descriptive essays, our readers have already been placed in a position to form an opinion of the utility and general merits of this handy volume of "journeys."

### York's Lantern Readings—India.

London: F. York, 87, Lancaster-road, Notting Hill, W.

When describing the first attempt of the South London Photographic Society to give a "popular evening," a short time ago, we spoke of the exhibition of a series of Indian views, accompanied by a lucid verbal description by a gentlemen who was present, as a noteworthy feature in the proceedings of the evening. Such was the high estimation in which the description was held that Mr. York appears to have been induced to issue it in the form of a *brochure* of twenty pages, each descriptive item being numbered to correspond with the number of the respective picture. To give isolated extracts from the work would scarcely be appreciated unless one had the picture also at hand to which to refer; but, for all that, there are not a few of the fifty lecturettes exceedingly interesting *per se.* In No. 3, for example, which describes the picture, *Coolies Crossing a Bridge of Frozen Snow*, we incidentally learn that these coolies are engaged in carrying the photographic artist's apparatus, sleeping tents, provisions, and cooking apparatus, there being no hotel accommodation in those portions of the country. The artist, we are told, has sometimes to take live sheep with him to feed his retinue. This statement will, we imagine, recal to the minds of our older readers the graphic narratives of tours in the higher Himalayas and other parts of India, contributed some years back to this Journal by Mr. S. Bourne, at that time a resident at Simla.

The introductory chapter, although brief, gives one of the best condensed summaries of India we have ever seen. Every sentence of it conveys information—a fact which the reader will admit after a perusal of the following, being the concluding paragraph of the "introduction" intended to accompany the *Map of India:—*

"India is, as it were, an epitome of the whole world. It has regions that bask beneath the brightest rays of a tropical sun, and others as dreary as the most awful depths of the polar world. Its vast plains present the double harvests, the luxuriant foliage, and even the burning deserts of the torrid zone; the lower heights are enriched by the fruits and grains of the temperate climates; the upper steeps are clothed with the vast pine forests of the north; while the highest pinnacles are buried beneath the perpetual snows of the arctic zone. The variations that have been mentioned divide the year into three seasons—the hot, the rainy, and the cold or, rather, temperate—which last is a good deal longer than the other two. The intenseness of the rain can scarcely be conceived in Europe. Though it is confined to four months, and in them many days of every month and many hours of every day are often fair, yet the whole fall of rain in India is considerably more than double that which is distributed over the whole twelve months in England, amounting, in parts of Assam, to 500 inches!"

This lecture, as may be gathered from its paging, is evidently intended to form a portion of a volume of lectures of a similar character. If they are all equal to that now noticed they will prove most invaluable contributions to the class of literature which forms the subject of the present and previous notices.

## Meetings of Societies.

### EDINBURGH PHOTOGRAPHIC SOCIETY.

The second popular meeting of the session was held in Queen-street Hall, on the evening of Wednesday, the 17th instant,—the President, Dr. Thomson, in the chair. There was, as usual, a very large attendance.

The exhibition consisted of a series of pictures illustrating a tour through the North and West Highlands, and were the joint production of Mr. Wilson, of Aberdeen, Mr. Valentine, of Dundee, Mr. W. H. Davies, and several of the members who made the tour.

The President, in introducing the lecturer, Mr. W. H. Davies, said that he thought it right to take the opportunity, when so many of the friends of the Society were present, to call general attention to the work which the Society was doing. In addition to the ordinary meetings held for the purpose of reading papers on photography and kindred subjects, and carrying on discussions from which much mutual benefit was derived, there were during the summer a series of most delightful outdoor meetings, where, with cameras in hand, the members roamed over hill and dale in search of the picturesque and the beautiful, and, although they might not always be able to secure all they could wish in that line, they never failed to get fresh air, necessary exercise, most genial and social companionship, and, as a natural consequence, good health and much happiness. Those two branches of the Society's operations were carried on at comparatively little cost, but it was different with the third, and certainly not the least valuable, part of the work in which the Society was engaged. He alluded to the popular meetings, of which the present was an example. The "popular evenings" of the Edinburgh Photographic Society had, he said, become an institution in the city. They from time to time gave gratuitously to many hundreds of the inhabitants an opportunity of seeing some of the finest productions of the camera in their own or other countries, and by means of the generally-interesting lectures which accompanied those exhibitions they were also afforded a large amount of valuable information. Those popular meetings, it would be very evident, cost a good deal of money, and the Society looked to the public to assist in finding the necessary funds. The public hitherto had responded very well, as would be understood from the fact that they had probably two hundred of what he might call non-photographic members; but still there was room for a few hundreds more, and, as the subscription was only five shillings per annum, he hoped the Secretary would have many applications from gentlemen, and ladies too, who were willing to submit themselves to the ordeal of the ballot box.

Mr. Davies then proceeded with his lecture, in which he stated that, along with several of the members of the Society, he resolved to spend a few days in the North and West Highlands for the double purpose of shaking the city dust out of their brains and getting up material for a popular evening. They left Edinburgh by an early train, arriving in Greenock at nine o'clock, in time to catch the "Iona"—that prince of Scottish steamers—which quickly and pleasantly carried them down the Clyde to Rothsay, and through the far-famed Kyles of Bute, to Ardrishaig. Instead of following the usual or royal route to Oban, they then diverged to Loch Awe, up which they sailed in the smallest of small steamers, capable of dining only some eight at a time, and their number was seventeen. After a day or two of rest and work they next passed through Glencoe to Fort William and Corpach, where they settled down in the enjoyment of highland air and *mountain dew*, and so well pleased were they with the latter part of the enjoyment that out of gratitude they unanimously carried Ben Nevis as an honorary member of the Society, thus proving them to have been a set of *tight-uns* (Titans). From Corpach their route lay through the Caledonian Canal to the famous Falls of Foyers, and thence to Inverness. In the highland capital they enjoyed themselves much and secured some good

pictures, and proceeded through Culloden Moor to Aberdeen. They were not fortunate enough to find Mr. G. W. Wilson at home, but made the best of their time in visiting some of the largest granite works in the world, and then started for Balmoral. Here, of course, they wished to try their plates, but having omitted to get the necessary order they were somewhat afraid that a difficulty might occur with the old woman who kept the gate at which they wished to enter. A judicious expenditure of a mixture of flattery and whiskey, however, proved an "open sesame," and all went so far well. They afterwards discovered that there was no necessity for even the expenditure mentioned, as any ordinary piece of writing would have answered the purpose, the old lady being perfectly innocent of a knowledge of the art of caligraphy. They then proceeded to Braemar, in expectation of being present at the annual "gathering" which has made that place famous, but found that they were just too late by a week, and had to content themselves with a picture of it, which was shown on the screen. Here some pleasant days were spent, and some excellent pictures secured. The return home was through the heart of the Grampians, by the passes of Cluny and Glenshee, the first halt being made at Blairgowrie. Here there was neither time nor opportunity for photographic work; but the loss was fully compensated for by a visit to see the national drama of *Cramond Brig* performed in the Theatre Royal—a canvas erection, which, if not quite up to the usual mark, had, at least, the great qualification of being thoroughly ventilated, and where they saw the company feasting on a real sheep's head, at the low charge—not for a share of the feast, but for admission to the boxes—of threepence each. From Blairgowrie they found their way to "Bonnie Dundee," where some pictures were also obtained, and thence, through the "Kingdom of Fife," back once more to "Auld Reekie," very much delighted with the tour.

The pictures were unusually fine, and elicited the almost continuous applause of the large audience.

On the motion of Mr. Dobbie a hearty vote of thanks was given to Mr. Davies, and also to Messrs. Wilson and Valentine for their share of the pictures exhibited.

# Correspondence.

THE BELGIAN PHOTOGRAPHIC EXHIBITION OF 1875.—THE INVENTION OF M. DESPAQUIS.—VENTILATION.—PAINTERS AND PHOTOGRAPHY.

I HAVE just received a circular from the Secretary of the Belgian Photographic Association informing me that it is the intention of that Society to organise a photographic exhibition at Brussels (under royal patronage) for the month of July.

I have great pleasure in recommending this Association to the attention of all persons interested in the progress of photography; for, although the Society is young, having commenced its work only last May, it has given, nevertheless, proof of great vitality, which can be seen not only in their interesting *Bulletin*, but by their unceasing exertions to extend the circle of their action to other towns less favoured than the metropolis. Branch societies are already established at Ghent and Liege—all working well, a healthy emulation being thus created which has already brought forth fruit. Their first exhibition bids fair to become a flourishing one. French photographers are preparing for the struggle after fame, and I feel sure that English photographers will not be slow in answering to the appeal made by the above Association. For the last few years photography has made great progress in Belgium, so the palm will not be borne off with ease; therefore honour is to be won by those only who will strive to obtain it.

In the interest of some of the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY I will extract a few items from the official circular. Those who desire to have full information I recommend to write to the Secretary of the Association for a copy of the rules and regulations.

The exhibition will be opened on the 15th of July and close on the 15th of September. All pictures, &c., for exhibition must be forwarded, carriage paid, to "M. Rommelaere, Secrétaire Général de l'Association Belge de Photographie, au Cercle Artistique et Littéraire, Brussels," from the 1st to the 15th of June, in order that such objects may be laid before the jury of admission.

Towards the close of the exhibition a special jury will be elected, composed of eleven gentlemen, four of whom will be chosen from among the members of the Society, and five from among the foreign exhibitors. These last will be elected by the votes of all the foreign exhibitors assembled on the 1st of August for that purpose. Exhibitors who are unable to be present can forward their vote by post. The duty of this special jury is to award medals and honourable mentions to the exhibitors whose productions are considered worthy of that honour.

It is the intention of the committee to purchase many of the objects exhibited, in order to organise "*une tombola*" (a kind of lottery) for the close of the exhibition.

The sum of five francs (4s. 2d.) is to be paid for each square superficial metre required. It is to be hoped that the efforts of this youthful Association will be crowned with success.

Having received many letters from subscribers of THE BRITISH JOURNAL OF PHOTOGRAPHY, requesting information as to the working of the new process of printing in fatty inks respecting which M. Despaquis has inserted an advertisement in that publication, I thought it my duty to pay a visit to the large firm of Lemercier and Co., of Paris, where the process is in full work. The proofs I saw thrown off were very good, but no better than those generally printed in fatty inks. I asked the workman what was the advantage of the improvements made by M. Despaquis. He replied that the great advantage consists in a chemical change of the gelatine, which permits thousands of proofs to be printed from the same pellicle, whereas previously only a few could be taken from the same film—more or less according to the state of the weather. As a cloth roller is now employed with success instead of a sponge for damping, there is now no reason to substitute the common hand-press for a machine driven by steam power for the printing of photographic proofs. In fact, M. Despaquis himself says that he does not expect to be able to print better proofs than those I lately received from one of the subscribers of this Journal (Mr. A. Findlow, of Warwick), and which proofs were presented to the Photographic Society of France; but M. Despaquis says:—"I am certain that with my process proofs can be made in a more rapid and economical manner than by the old method."

Many methods have been proposed for the ventilation of the dark room. Most of them have their birth in the winter season, when it can be seen how easy it would be to take advantage of the flue of the stove of the studio, in order to create ventilation for the dark room. Some of these inventions, though good, are both elaborate and expensive, and I fear on that account are laid aside by the greater number of photographers; for we must remember that, although a small number have been able to make a fortune and are thus enabled to make a trial of any change likely to prove successful, the greater number, alas! are obliged, as it were, to feel their way, taking care of the pence, hoping that the time may come when they can leave the pounds to take care of themselves. Such photographers I am certain, would be very thankful to have a few suggestions for the proper ventilation of their studios, which could easily and without great expense be put in practice.

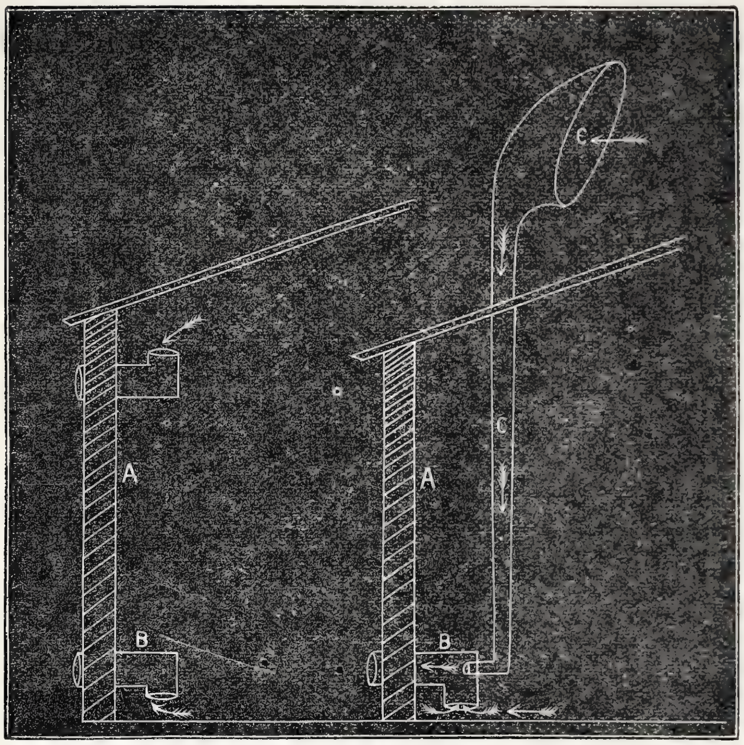
How frequently do ladies complain of the smell of collodion in small photographic studios. Had the person who built the studio constructed the dark room a yard lower than the floor of the studio no disagreeable smell would have found its way there, exciting the nerves of the lady who has been already disconcerted by long waiting, and who, when about to sit for her portrait, becomes exasperated with the operator. Success in business often hangs on a single thread; and who knows whether the simple circumstance of letting a little ether enter into the studio has not been the cause of the loss of fortune to many! M. Adam-Salomon says—"I always endeavour to make the sitters contented with themselves." How can this be done if they are annoyed by an odour to which they are unaccustomed? M. Adam-Salomon has well understood this, for I suppose it is for that reason he has had his dark room constructed below his studio (see THE BRITISH JOURNAL OF PHOTOGHAPHY, page 605, December 18, 1874), and from which the prepared plate is sent up to the studio by means of a movable box attached to a pully.

Another reproach which can be brought against photographers is that they are not sufficiently careful of their own health. They remain for a long time in a dark room vitiated by unwholesome vapours. Happy, indeed, is it if the latter are composed only of ether, alcohol, carbonic acid, and iodine; but, unhappily, they are often mixed up with the pernicious fumes of cyanide of potassium—dangerous enough in itself, but how much more so when in presence of the vapours of the different acids used in photography!

In country towns it is very easy to secure good ventilation, but in cities it is somewhat difficult. Good ventilation can be cheaply secured by means of two openings—one at the top, to carry off the hot air, and the other at the bottom, to carry off the carbonic acid gas and the ether, the vapours of which are very heavy. In order to prevent the light entering, two elbows, as in stove piping, are morticed into the holes (see *fig.* 1). The only objection to this is that when the wind

blows from a certain direction it drives the smell of the collodion into the house. I have modified this system for my laboratory, and instead

FIG. I. FIG. 2.




of the elbow on the upper part of the wall I have constructed a kind of blowing machine, which not only carries off any vapour formed in the dark room, but draws air from the door communicating with the other parts of the house (see *fig.* 2). A represents the wall; B a zinc elbow; C a zinc tube constructed on the same principle as the ventilators on board steamboats. Its head must be turned towards the quarter from which the wind prevails; its lower end must enter into the back of elbow B. The wind rushing down this tube carries along with it to the outside of the house a great part of the vitiated air of the lower part of the dark room. I have observed that when the sun shines on the ventilator during a calm summer's day another current was formed, and, instead of drawing the air from the dark room by the lower openings in the wall, it was, as it were, sucked up the tube C, aided, no doubt, by the warmth of the dark room. In either way the object sought for was attained.

Has photography rendered service to painters? That is a question which, I am certain, can be answered affirmatively. Unhappily there is a sort of *mauvaise honte* attached to the idea of calling in the aid of photography in the painting of works in oil, and many artists who utilise photography endeavour as much as possible to hide their doing so from the uninitiated, fearing that their artistic *prestige* might be lessened if the *vulgaire* knew that their *chefs d'œuvre* were not wholly due to inspiration. It is to be remarked that painters who occupy themselves with photography are generally known by their productions. It may, indeed, be said that they are betrayed by the works of their own hands, for in the pictures painted by them a truthfulness of drawing can be discerned which we might seek in vain in the pictures of some of the best ancient and modern artists.

There are several ways in which painters can avail themselves of the aid of photography to assist them in their inspirations. One of my artistic friends goes into the country with his easel, box of colours, and *camera obscura*. When a landscape is chosen which presents a fit subject for composition he commences by roughly sketching it on the canvas; when this is done he takes one or two photographic views, and the next day a photographic print is beside him on the easel, which presents to his mind a *souvenir* of the landscape. His eye, his memory, and his intelligence guiding him, he produces on the canvas what he saw the day before.

Another well-known artist goes into the environs of Paris to spend the day, accompanied by his wife and a few select friends. Having chosen a site he places his friends in artistic groups, takes several photographs, chooses the most likely to please the public, trusting to his memory for the colouring, and rarely misses his aim.

Another painter acts in the following manner:—He goes into the country with a stereoscopic camera, takes several views of the landscape he wishes to reproduce, and, after the development of the negatives, by means of a magic lantern he throws the enlarged proof directly upon the prepared canvas.

Portrait painters do not disdain to employ photography, especially for the reproduction of persons who are deceased, and of whom their bereaved friends wish to have a *souvenir*. If a *carte de visite* is to be found it is handed to the artist, who receives the order to make a large oil painting from it. He sends it to be enlarged, and when he receives the negative he places it in a printing-frame, and lays upon it a pellicle of gelatine covered with bitumen (which is easily obtained in Paris). It is now exposed to the rays of the sun, and in an hour or two the pellicle is taken out of the printing-frame and plunged into a solution of turpentine. This dissolves the bitumen, which has been protected from the light, without damaging in the least the gelatine pellicle. A very good positive is thus produced, which is laid upon the canvas and pressed into its texture, forming a truthful design for the artist to work upon.

E. Stebbing, *Prof.*

3, *Place Bréda, Paris, February* 23, 1875.

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Transit of Venus in Australia.—Scröder's Eleven and a-Half Inch Equatorial.—Successful Negatives Obtained at Sydney and Woodford.—The Intended Colonial Exhibition.

After a long period of silence I am at length able to communicate news of interest to all photographers. I need hardly say I refer to the transit of Venus. I do not propose to give an account of the observations generally, but will confine myself to the photographic department.

Mr. H. C. Russell, the government astronomer, besides being an exceedingly clever mechanician, is an amateur photographer, and consequently had all his arrangements prepared in the most efficient way. He had also put his little army of observers and operators through a course of training.

To increase the chances of favourable observations four stations were chosen. Two of these were on the coast—one being at Sydney, and the other at Eden, Twofold Bay, 280 miles to the south. The other two stations were inland—at Goulburn, 134 miles to the south-west, 2,170 feet above sea level, and at Woodford, on the Blue Mountains, fifty-five miles to the west, and 2,190 feet above the sea level.

Dallmeyer's photoheliograph was used at the latter place, where the air is usually beautifully clear and pure. At the other stations the instruments consisted of equatorial telescopes with cameras attached, the enlarging lenses being an arrangement of Mr. Russell's own devising, costing only four shillings, whereby he gets pictures perfectly free from distortion and, he considers, equal in every respect to those produced by Dallmeyer's costly instrument. The visual and actinic foci are not coincident, however. All were arranged to give the image of the sun four inches in diameter. The wet process was used, and each party was prepared to produce about two hundred negatives if all went well.

Through the courtesy of Mr. Russell, a few days before the event I was enabled to examine the apparatus at the Sydney observatory, and to see the operators go through their practice.

The telescope is a splendid eleven and a-half inch equatorial, by Schröder, of Hamburg, lately imported expressly for the transit. The camera consists of a slightly-conical tube of thin sheet iron, attached by screws at the smaller end to the telescope, and near the same end are the enlarging lenses. As the observatory itself is converted into an operating-room no dark slide is required, but the plates are simply held to the end of the camera by a spring clamp. The instantaneous shutter has a very narrow slit, and passes through an opening in the camera just behind the lens. It is drawn up by a lever held by a catch, and when released the shutter is flashed down by an elastic band which passes round the camera and by a catch on the shutter. The exposure is about the fiftieth part of a second. At the instant of exposure the lever comes down on a brass spring which completes an electric circuit, and the time is automatically recorded by the chronograph. The apparatus was the same at the other stations, the telescopes only being of different apertures.

There is plenty of room in the observatory, and abundance of yellow light, so the operators could work with comfort, while dust and temperature were kept down by sprinkling the floor with water. One operator coated the plates and slipped them into the baths, of which there were four, arranged on a revolving stand; the second removed and exposed the plates; Mr. Russell himself developed and fixed them; while a

fourth watched the chronograph. In this way the negatives were easily produced at the rate of seventy an hour. Occasionally the clockwork was stopped and two impressions taken on one plate at the interval of a minute, in order to test the instrumental adjustments.

The 9th of December was looked forward to with some anxiety, as the weather had been rather unsettled, but hot—about 90° in the shade, and in the operating room from 83° to 87°. Owing to the heat the atmosphere was not so steady as could be desired. During the ingress the micrometer was attached to the telescope and observations made with the eye; but when the planet was entirely on the sun's disc the camera was brought into position and photographing began. All went well until towards the end, when a small screw got loose in the clockwork and threw the telescope out of gear. Besides the time lost in discovering and rectifying the mishap a few plates were lost in the consequent hurry. However, out of one hundred and ninety plates used during the three hours' work one hundred and eighty good negatives were secured. As egress began the camera was removed and observations with the eye resumed.

At Eden it was cloudy during the afternoon, and I think only about fifty plates were exposed, many of them being fogged by the light reflected by the clouds. However, most of them are perfectly good for the purpose required.

At Goulburn the day was fine, but very hot. The photographs taken there will, I am afraid, prove valueless, as the camera, it was afterwards discovered, was through some accident or blunder more than half-an-inch out of focus.

At Woodford the air was, as anticipated, beautifully clear. Sixteen Janssen plates were exposed during ingress and egress, securing nine hundred and sixty images of those phenomena. The apparatus is, I believe, Mr. Warren De la Rue's modification of Janssen's; but Mr. Russell is not at all satisfied with it, on account of the difficulty in changing the plates and the amount of time thus lost. The instrument arrived too late for him to make any alterations; however, the operators must have managed it very skilfully to expose so many as sixteen plates. Only ninety other plates were used, all resulting in fine negatives. I believe the photographers were a good deal delayed through the other observers wishing to compare chronometers during the transit.

On the whole the day's work must be considered highly satisfactory. There were secured nine hundred and sixty photographs of ingress and egress, and over three hundred of the planet on the sun—probably more than have been taken at all the other stations put together.

I have since been to the observatory to examine the negatives. It struck me as curious that the outline of the planet should be perceptibly irregular; but as it appeared perfectly round to the eye I conclude that the indentations must be caused by halation. This may, perhaps, render accurate measurement more difficult. The negatives will be forwarded to the Astronomer-Royal by instalments for greater security.

In Victoria there was, I believe, only one photographic station, namely, at the Melbourne Observatory, where the great telescope and a heliograph were used. The weather was very unpromising; but, fortunately, just after ingress began the clouds parted, and about fifty impressions of the ingress were made. At intervals, also, during the transit breaks in the clouds permitted plates to be exposed; but I do not know how many or with what results, as dry plates were used, and I have not yet heard the result of the development. The rain had made the atmosphere clear and steady.

Bad weather prevailed both at Hobart Town, Tasmania, and at Adelaide, South Australia, though it cleared toward the end of the transit. At the former place seventy-four photographs of egress on Janssen plates, and thirty-nine of Venus on the sun, were taken. At the latter station only five photographs were obtained.

I am very glad to see by London telegrams that the observations were successful at the corresponding stations.

When he has time Mr. Russell intends to make known his arrangement of the enlarging lenses. I enclose a photograph of the moon, the result of one of the first trials of it. He has since made it more perfect, and can do better work.

I also send a photograph of the interior of one of the photographic observatories, showing the camera attached to the telescope, and also the other apparatus, which is crowded together more than is usual in practice in order to bring all into the field of the camera. In justice, too, to the photographer it should be mentioned that, being the picture of a dark room, the exposure of the plate was three-quarters of an hour; however, the different parts are shown with tolerable distinctness. On the right is the box of baths, and on the left the automatic chronograph, with the battery underneath. The electric wires may be seen crossing from the instantaneous shutter on the camera.

When I last wrote I promised to give further accounts of Mr. Holterman's scheme of a great photographic "exposition" of the colony. Soon after I wrote Mr. Beaufoy Merlin, who was carrying out the work, and was, I believe, the originator of it, died suddenly. His death put a stop to operations, and I do not know whether the scheme will be carried out now. Mr. Merlin was an enthusiastic photographer, and was also ready with his pen. He was contributing to one of the papers an account of his tours, and his last article appeared in the same issue which announced his death.

The work of the portrait photographers shows considerable improvement, but Mr. Newman is still *facile princeps*. Some really good landscape photographs may now be seen in the print shops.

Our Amateur Photographic Society is, I am sorry to say, not in a very lively condition. E. B. Docker, M.A.

*Sydney, December* 22, 1874.

[The photograph of the moon, which is rather over two and a-half inches in diameter, is most excellent.—Eds.]

## THE NEGATIVE BATH.

*To the* Editors.

Gentlemen,—I have been anxiously waiting to hear the report of the Investigation Committee regarding the method of keeping the bath in perfect working order, as announced some time ago by Mr. B. J. Edwards. I think some explanation is due to your readers. Why is there so much delay in issuing this report?—I am, yours, &c.,

49, *King William-street, February* 23, 1875. A. L. Henderson.

[We were present when Mr. Edwards conducted his experiments before the Committee, and at the close that Committee decided to abstain from, or at any rate delay, giving any report upon the matter.—Eds.]

## LONDON PHOTOGRAPHIC SOCIETY.

*To the* Editors.

Gentlemen,—In my note, printed in your Journal of today, I find, on reading it over, that what I have said of the action of the clique in the Photographic Society might, without more qualification than I gave, be taken as intimating that Mr. Glaisher had any participation in the secret workings of the "ring;" and I hasten to say that I entirely absolve him from any conscious complicity in these things. Without changing my opinion of his official qualities or the influence of his peculiarities on the welfare of the Society, I believe him to be an honourable and well-intentioned man, and without any idea of the operations to which he was made to give the cover of his personal respectability.

It was, indeed, *his* scientific position and personal character which made the plans of the clique so effective and so difficult to counteract—a fact which increases the offence of those who availed themselves of his unsuspectingness to operate behind an honoured name and scientific reputation, and shows how imperative it was that the old system should be broken up, and the government of the Society thrown open to publicity and general participation by the Society at large. The facilities of a close corporation offer too great a temptation for the formation of "rings" to make it advisable that any organisation like ours, where there are commercial and pecuniary interests at stake, should be left to the practical management of three or four individuals. The country members know nothing of these things; but we who attend the meetings have had abundant opportunity to see what is going on, even in secret conclaves, and to understand the truth of my statements, that the prosperity of the Society and its efficiency have been sacrificed to the advantage of a very small clique.—I am, yours, &c.,

8, *Altenburgh-gardens, Clapham Common, London, February* 19, 1875. W. J. Stillman.

*To the* Editors.

Gentlemen,—In connection with Mr. Stillman's letter in your last, it may be as well to bear in mind with reference to the election of Mr. Glaisher that only about one-fifth of the votes of the Society were given for him, and certain of these *were so given* because, from the official heading and character of the secret circular, the recipients supposed that this document was sent out as *an expression of Mr. Spiller's desire that his friends should vote for Mr. Glaisher.*—I am, yours, &c.,

X. Y. Z.

[We are aware of the foregoing interpretation having in several instances been put upon Mr. Pritchard's letter.—Eds.]

## THE SCIOPTICON AND TURNBULL LIGHTS.

*To the* Editors.

Gentlemen,—I have been much interested in the discussion respecting the relative merits of the sciopticon and triple-wick lamps. I have made experiments as to illuminating power in the lantern with every variety of lamp I could obtain, and I have been compelled to give the Silber lamp a position superior to either a duplex or triple-wick burner.

A friend of mine, with whom I have experimented, made a triple-wick burner some years ago; but its greatest faults were the flickering and the dark lines produced on the sheet between each of the wicks. To obviate this we had the centre wick perpendicular to the condenser and the two side wicks tapering towards the front. Thus we obtained a fair disc; but the flame was not sufficiently steady, so we gave up the idea of using a triple wick.

This season I have had some half-dozen different burners, including the ordinary Silber and an immense Silber; but with the larger burner I

could not obtain better results than with the smaller one. I have had, also, a so-called "Queen's" burner, made somewhat in the form of the Silber; but the light was of a yellowish tint, hence this was put aside.

After using the Hink's duplex and many others I got the sciopticon, tested its illuminating power with a standard candle, and found it equal to thirty-nine candles. Now one might use a rushlight and get it as 150 candles; but in these measurements nothing but a standard candle should be used. I have, after many measurements with different photometers, only obtained thirty-nine candles, so that I should be much obliged to Mr. Woodbury (who I cannot think would wilfully misstate anything) if he would tell me how to use the sciopticon so as to be equal to fifty candles. I certainly agree with Mr. J. M. Turnbull that measurements of intensities outside the lantern are practically useless when used to express illuminating power in lanterns; and I was much surprised at Mr. Winstanley's letter.

Again: the measurements, to be accurate, should be made with the two lamps in the same lantern, using precisely the same pair of condensing lenses and the same object lenses. You cannot depend upon two sets of lenses being alike.

Respecting the light most suited to lanterns we have two necessaries—first, the light should be as small as possible; secondly, it should form a continuous flame—that is, should consist of an unbroken flame. This can only be obtained by the circular wick.

The lime light is our typical light, and the nearer we get our lamp flame to the size of the lime light, coupled with the best illuminating result we can obtain, so shall we reduce spherical aberration to its lowest sum, and produce a disc of equal illumination. This is fairly accomplished by using a Silber lamp; but one looks forward to a burner still better than the Silber. I have not found this in either the duplex, sciopticon, or the triple-wick. I must, of course, say that I have not used Mr. Turnbull's lamp; but from the remarks made respecting it in the Journal I have assumed it to be very similar to our old one, with, probably, a little more illumination. I have a great objection to the large flame of the triple and duplex lamps; that is, the great amount of spherical aberration. I was very much surprised with this in using the sciopticon. This can only be reduced by using a smaller flame.—I am, yours, &c., W. J. Lancaster.

*Bull-street, Birmingham, February* 20, 1875.

*To the* Editors.

Gentlemen,—I thank Mr. Winstanley for his kindness in offering to test the two lights; but I think I would prefer to prove what I have stated before several persons, and, as soon as my health permits, will take an early opportunity of doing so.

I may explain one matter Mr. Winstanley does not understand, viz., how two wicks can give more light than three. It is in this way:—The sciopticon has two flames of about two inches long of pure, steady white light; whereas, the other lamp cannot give a flame longer than three-quarters of an inch from each wick without smoking. Hence we have in the one instance four inches of bright flame, and in the other three times three-quarters of an inch, or two and a-quarter inches of bright flame, being about the proportion of light given by each.—I am, yours, &c., Walter B. Woodbury.

*February* 23, 1875.

## MR. GLAISHER AND THE LONDON PHOTOGRAPHIC SOCIETY.

*To the* Editors.

Gentlemen,—The Hon. Secretary of the Photographic Society of Great Britain presents his compliments to the Editors of The British Journal of Photography, and begs to forward the enclosed letter from Mr. Glaisher for publication.

9, *Conduit-street, February* 19, 1875.

1, *Dartmouth-place, Blackheath, February* 17, 1875.

My dear Sir,—Since the receipt of your letter this morning I have had under thoughtful consideration the acceptance or not of the post to which I have been elected.

I have all along believed I had the confidence of the Society; and although I had resolved not again to return to the presidency, still with such a large vote in my favour it would seem to be ungracious on my part not to accept the proffered honour.

This determination I have arrived at, also, on account of the many wishes expressed by old and valued members, who say that it will be for the good of the Society that I do so.

For these reasons I have resolved to accept the presidency of the Photographic Society; at the same time I fear that I cannot promise regular attendance, and I should wish it to be understood that I resume the chair but for a limited period.—I am, dear Sir, faithfully yours,

James Glaisher.

R. J. Friswell, Esq., F.C.S., &c., &c., *Hon. Sec., pro tem.*

## ANSWERS TO CORRESPONDENTS.

☛ ***Correspondents should never write on both sides of the paper.***

Jas. Valentine.—Received. Thanks.

Ixion.—1. Seven feet.—2. About forty degrees.

H. H.—Try a mixture of albumen and freshly-slacked lime.

L. Case.—The cover is faultless, but the object-glass is too small.

D. G.—The matter is of too limited interest to warrant our directing attention to it in the manner you suggest.

Nemo.—Your communication is unsuited for the pages of a photographic journal, and hence is declined with thanks.

O. P. Q.—We think the work is out of print, but you may make application a Messrs. Churchill and Sons, New Burlington-street.

L.—We are unable to indicate any town, near London or elsewhere, in which you can start a business with a *certainty* of success.

Heliotyper.—The specification is not yet published, consequently we do not know the special feature of novelty in the invention.

R. Manson.—The sample of albumenised paper enclosed is very slightly salted indeed; hence there would be no advantage in using the strong bath proposed.

Lionel.—1. The lens you mention is said to be quite free from flare.—2. A portrait lens corrected for flatness of field is the best for enlarging purposes.

S. A. E.—We cannot tell by what means the picture was produced; we considered it so bad that we never bestowed a thought upon the method of its production.

Electro-Metallurgist.—A good varnish for your purpose is that originally recommended, viz., a solution of sealing-wax in alcohol of about the consistence of very thick cream.

S. W. G.—The correspondent who under these initials wrote on the Woodbury-type process in September last, is requested to communicate with Mr. Solomon, of Red Lion-square.

J. J. A.—1. Kindly send us an account of the method of registration you propose for the dissolving "effects."—2. Let the negative be rather thinner than if it were required for silver printing.

R. G. Arnold.—Mackintosh cloth of the kind required is sold by Messrs. Lee Brothers. We have no idea of the price. We shall be pleased to receive a description of the tent when it is completed.

C. F. R.—In erecting the solar camera the convex side of the condenser must be next the sun. We cannot give any information respecting the best focus of lens to employ unless we knew more particulars.

T. B. B.—The best of the original ten copies of the *Two Ways of Life*, by Rejlander, is in the possession of Mr. Greenwood, the publisher of this Journal. Your suggestion is quite impracticable; but we have "passed it on" to the parties concerned.

Carboniensis.—The whole of the manipulations have been correctly performed; but the water used for developing the image has been too cold by many degrees. The specimen of pigmented tissue enclosed is really excellent, being very soluble and possessing a good colour.

B. Gandlier.—There are many ways of decolourising old and red collodion; but there is no way, so far as we know, by which old collodion can be restored to its pristine condition as regards excellence. By shaking up the filings of zinc, silver, or cadmium with the collodion, the colour will soon disappear.

A Dublin Artist.—1. The cards contain hyposulphite of soda.—2. We cannot suggest any *easy*, or, indeed, *any*, means by which the soda can be eliminated. One course only should be adopted, that being the destruction of the whole stock. Better do this than have your reputation placed in jeopardy.

Colonel Stuart Wortley writes as follows:—"Canon Beechey's kind letter is very gratifying to me, because it shows that my labour has not been in vain, and that the friends to whom all my improvements and 'dodges' have from time to time been communicated have profited by them." In reply to Canon Beechey's observation concerning the preparation of uranium plates commercially Colonel Wortley says that they may be procured from Messrs. Chambers and Co., who have taken over the Uranium Dry-Plate Company's business.

*** We have many articles in type which we regret we cannot find room for in the present number. We hope to include them in our next.

West Riding of Yorkshire Photographic Society.—The next meeting of the above Society will be held on Monday evening next, the 1st March, at half-past seven o'clock, at the Victoria Hotel, Bradford.

Photographers' Benevolent Association.—Concerning the art-union distribution of photographs for the benefit of the funds of this Association, Mr. Wilkinson, the Secretary, has given us an explanation as to the postponement of drawing. The Secretary wrote to the Board of Trade for permission, under the Art Unions' Act, to hold such art union. A reply was received which was wrongly interpreted. After the receipt of that letter handbills and tickets were issued, and the co-operation of agents solicited (in good faith). Nearly 3,000 tickets have been sold, and the proceeds paid into the London and County Bank to the credit of the Photographers' Benevolent Association. At the last moment the Secretary received a letter threatening proceedings from a solicitor, instructed either by an informer or by a rival art union. On the receipt of this letter, legal advice was obtained, and under that advice the drawing was postponed. Steps are now being taken to obtain a royal charter. In the meantime the Board of Management ask the indulgence of ticket holders, with the assurance that the drawing shall proceed as soon as possible, due notice of which will be given by advertisement.

CONTENTS.

# THE BRITISH
# JOURNAL OF PHOTOGRAPHY.

No. 774. Vol. XXII.—MARCH 5, 1875.


## THE PATENT REVOLUTION.

A sweeping alteration in our patent system is about to be effected. Whether such alteration shall, on the whole, be an improvement is a subject upon which there are various opinions. Some points, however, of this revolutionary action will, when explained, commend themselves to our readers as being decidedly an improvement on the old system. That there is much room for progressive action no one doubts, for the state of our patent laws at present is not a credit to a civilised and great manufacturing community.

The Lord Chancellor, in the House of Lords, on the 13th ult., intimated the intention of Government to bring in a bill to alter the law by which letters patent are granted in this country. The bill having since passed a second reading, we may now take it for granted that it will become an act of parliament after it has run the gauntlet of committees of both branches of the legislature, and been subjected to such alterations as may be deemed desirable in its passage through parliament. We shall now indicate some points in which the proposed new bill at present differs from the previously-existing law of patents.

Whereas hitherto the applicant for a patent had only to give a rough outline of the nature of the invention for which he sought provisional protection, reserving full particulars for his complete specification, he must, if the new bill be passed in its present shape, file at once a full specification of his invention, which shall be published so as to enable any person, if so minded, to oppose the grant. His invention is to be submitted to an examiner and expert referees, whose duty it will be to report—(*a*) whether the invention is a proper subject for a patent; (*b*) whether the invention is properly described in the specification; (*c*) whether, so far as can be ascertained, the invention is new; (*d*) whether the invention is in the nature, wholly or mainly, of a combination of known machinery, substances, or processes; (*e*) having regard to the last-mentioned consideration, or to the consideration that the invention is not of great importance or utility, whether it is expedient that the duration of the patent which may be granted be limited to seven years; (*f*) or whether, by reason of the frivolous character of the invention, or for any other reason, it is worthy of a patent. When the report of the examiner has been made, the application, accompanied by such report, is to be submitted to the law officer for his opinion, which will then, along with the application, be published.

Under the existing system a patent is granted for almost anything if it be not absolutely frivolous. There are many inventions which have been patented "over and over again." We had occasion, a few days ago, to search through some of the patent records in order to discover something connected with a means of conferring greater intensity upon an ordinary gas flame so as to render it suitable for use in a magic lantern, and were perfectly astonished at the great number of patents that have been, and are still being, obtained for an invention which was fully described and patented many years since. Even in photography instances of a similar kind are to be found. Not long ago we had occasion to direct attention in a somewhat marked manner to one special invention which, perhaps perhaps more than any other, has been made the subject of numerous patents, viz., the production of a gelatine relief from a negative, and obtaining a metallic printing surface from that relief. Under the proposed patent law this would not be permitted; for if, by accident, its previous publication should escape the search of the examiner and referees, who are to be "experts," the publication of the invention previous to the final granting of the patent will ensure attention being directed to it by previous inventors, who will not coolly stand by and see an interloper enter upon their ground.

In connection with the examination of an invention, and deciding whether it is or is not worthy of being granted protection, we can foresee a great deal of difficulty. Suppose that a patent for conveying coal gas through pipes for illumination had been applied for, and that such men as Sir Humphrey Davy, Sir Walter Scott, or Sir Joseph Banks had been called upon to "report" on it, where would the poor inventor have been? With these *savants* the idea was first an absurdity, and next an experiment fraught with exceeding danger. Inventions may have to suffer from the incapability of the examiners to grasp their scope, as well as from sympathetic or unsympathetic trade ideas of the "expert" assistants by whose opinions the examiner will, doubtless, be swayed to a very large extent. Again: "expert" opinions are sometimes worthless from the incapacity of the presumed expert. In America, where the examination system prevails, Mr. Thomas Ross applied for a patent for his doublet lens, but was refused on the ground that his doublet was similar to the pre-existing Harrison globe lens! Now, without speaking of the merits of either of these productions, what value could possibly attach to the deliverances of any body of examiners who could assert that the two were similar?

There is an excellent feature in the new bill which provides that it shall be imperative for the patentee to grant licenses to work his invention, failing which his patent may be revoked. We need scarcely stimulate attention to the value of this clause; it will be apparent to every one. It is known that capitalists not unfrequently purchase a patent for the express purpose of preventing the invention being brought into use, as it would militate against other interests; and, further, it is well known to many of our readers that there are patents claimed to exist in connection with photography the holders of which distinctly decline to grant licenses under which to work. This is a matter upon which we speak from personal knowledge. It is proposed that in future this exclusiveness will cease to exist; nor need the patentee "lay the flattering unction to his soul" that he can make the terms for a license so high as still to preserve himself from being deprived of the monopoly of manufacture, for, by the 27th clause of the bill, he must grant licenses "on terms which the Lord Chancellor deems reasonable."

In future foreigners who make applications for patents must do so in their own names, and not, as hitherto, through an assignee or agent; for it is stated, in clause 19, that "a patent shall not be granted on the application unless the applicant declare himself to be the first and true inventor, and *no patent shall be granted in respect of a communication from abroad.*" Further: a patent shall not be granted after the expiration of a foreign patent for the invention. If at the time of the application there be a foreign patent for the invention in force a patent shall not be granted unless the foreign patentee be the applicant, and his application be made within six months after the

date of the earliest foreign patent already existing in connection with the patent sought for in this country. Again: the patent shall cease on the ceasing of the first of the foreign patents, assuming such to exist. Clause 19, which we have thus summarised, has reference solely to patentees residing abroad, or aliens wherever resident.

After the bill shall have become an act of parliament we may again advert to it, and point out in what way it may affect photographers; for that it will affect them, and that advantageously, we entertain no doubt.

## THE BEST WAY OF VIEWING GLASS TRANSPARENCIES BACKED WITH GROUND GLASS.

In a recent article on the subject of the backing for glass transparencies we pointed out the undesirableness of using a ground glass for that purpose, and suggested some better ways of producing an even, translucent backing which should be free from granulation. But as most of the glass transparencies made hitherto are backed with ground glass, it is well that people should know the best mode of viewing them, so as to avoid as much as possible the objectionable defect of granularity, which is so destructive of the delicate details of the picture. The method which we are about to describe has the merit of extreme simplicity, and it can be tried in a minute, without involving either cost or trouble. It is as follows:—

If the transparency is to be viewed by daylight place a table close to a window, lay upon it a large sheet of perfectly-clean and smooth white cardboard, and then, instead of holding up the transparency to the light and viewing it in the usual way, hold it over the cardboard, and view it so that the illuminated sheet of cardboard may be the background or source of the light which passes through the transparency instead of the window. It will then be found that *all* granularity produced by the ground-glass backing vanishes, although the ground glass is still there and in contact with the picture. Even when a powerful magnifying glass—say of two inches focus—is used not the *slightest* granularity will be perceived.

If the transparency is to be viewed by candle or lamp light lay the sheet of white cardboard upon the table as before, so as to be strongly illuminated by the candle or lamp, and, holding the transparency a little way above it and inclined at an angle of about 45°, look through it with the illuminated cardboard as the background or source of light. All effect of granularity due to the ground glass will then vanish.

The reader will understand that in these experiments the ground glass is *not* to be removed from the transparency. It may remain in its place in contact with the picture.

It is certainly a singular fact that granularity can be *completely* got rid of in this way. This simple remedy for it is absolutely perfect, and leaves nothing to be desired. By substituting for the white cardboard sheets of cardboard or paper of different colours a variety of different and sometimes very pleasing effects can be produced.

We may here mention the fact that glass which has been treated with a mixture of hydrofluoric and sulphuric acids presents a much finer greyed surface than when it has been ground. We have now before us for comparison some pieces of glass, treated in this way, with which we have been kindly supplied by Mr. J. A. Forrest, of Liverpool, and their superiority over the finest ground glass is very apparent.

## THE BOUDOIR PORTRAIT.

The name of Mr. Valentine Blanchard is, with great propriety, intimately associated with the display of refined taste in matters appertaining to photographic portraiture. During the present week we have examined several prints, of dimensions different from those hitherto popular, from the *atelier* of Mr. Blanchard, and to which he has given the name of "The Boudoir Portrait." Messrs. Marion and Co., of Soho-square, are actively engaged in the preparation of appropriate mounts, frames, and albums for the new size, for which they anticipate a large demand, as this novelty in portraiture is likely to prove successful.

The *proportions* of the "boudoir portrait" are similar to the *carte de visite*, and to those adopted by Reynolds, Gainsborough, Lawrence, and the old portraitists for their full-length portraits of ladies. The size, which is $7\frac{1}{2} \times 4\frac{3}{4}$ inches, will not interfere with any style now adopted by photographers with so much success, financially; for it is so much smaller than a $10 \times 8$ as to prevent its becoming a rival to that favourite size. It wants the *squareness* of a cabinet, which, on account of its width as compared with its length, is not well adapted for displaying a single figure to advantage, owing to the eye being distracted by the accessories necessarily introduced in order to fill up the picture.

The "boudoir portrait" will certainly command the suffrages of the ladies, as it is well adapted for showing off to advantage a charming full-length figure and an exquisite *parure*, for which reason its popularity may be safely predicted. We have seen many specimens at the establishment of Messrs. Marion and Co., mounted in frames and other forms, and in appearance they are exceedingly attractive.

The dimensions of the mounting-card are $8\frac{1}{4} \times 5$ inches. From the size of the negative ($7\frac{1}{2} \times 4\frac{3}{4}$) it will be seen that no new apparatus will be required by the photographer, as portraits can be taken with the greatest facility by means of the ordinary whole-plate lens, the powers of which will, for this class of work, be much undertaxed; and there are, indeed, very few cabinet lenses worthy of the name which will not produce excellent pictures of the "boudoir" dimensions.

Having thus drawn attention to the new style of portrait, we conclude by expressing a hope that it will come into general use during the forthcoming season, and command much public appreciation.

## MOUNTS.

On a recent occasion, while preparing the last of our series of articles on photographic paper, we collected a very large number of mounts from photographers residing in all parts of the country, and were much struck with the variety of taste, and in many cases the utter absence of anything like good taste, shown in the collection. We have before us while we write nearly a hundred specimens, of which only a small proportion are, in style and quality, what we consider mounts should be; and, as we are more or less acquainted with the work and capability of almost all the photographers represented by these mounts, we are forced to the conclusion that even men of high professional standing do not, in a vast number of cases, give the attention to this department of their work which its importance, in our estimation at least, demands. The fact would seem to be that, now that the chemical and mechanical aspects of photography are supposed to be fully worked out, the entire attention of professional photographers is given to the art-phase of the subject, as produced by the posing and lighting of the model, and the brilliant and fine-toned printing of the so artistically-produced negative.

The profession, however, should always bear in mind that their work is only partially done when a fine print has been secured, and that the mount which forms its final resting-place may do much to make or mar its beauty. Just fancy an R.A., after bestowing his artistic efforts on the production of a high-class picture, handing it over to the tender mercies of a person of very ordinary capacity to be attached to a board with a broad white margin, or a margin of any colour, that happened to be contiguous! And yet it would be no worse than what seems, in many cases, to have been done in the selection of the mounts before us.

We have mounts of all thicknesses, from "two-sheet" up to thin millboard, which it must puzzle any one to force into the slits of an ordinary album; mounts of all colours, from pure white to as pure black; mounts so coarse that they must have been cut out of what is technically known as "waste cardboard," and mounts so fine that one is afraid to touch them lest the surface should be soiled; mounts which not only proclaim in conspicuous letters on the front that they were issued by " * * * , photo. artist," but have on the back an arrangement of cameras, tripods, and photographic tools in general, which, if in the possession of any person in a manufactured form, would prove sufficient to start an auctioneer for life; and

mounts so quietly modest that some little difficulty is found in making out the simple name of the very able photographer whose work they carry.

Now, all this is not as it should be. While there is plenty of room for variety in photographic mounts, there really should be no room for the very large quantity of vulgar rubbish which is, often thoughtlessly we are persuaded, so frequently used. The jeweller knows well how, by a suitable setting, to enhance even the most precious of his gems; and the artist, as we have already hinted, is aware of the influence which a frame exercises over his picture. We think, therefore, that it would be better for some of our professional photographers if they recognised the fact that the mount exerts a wonderful influence over the photographic print. This they may easily do by getting a few pieces of paper, a little larger than the prints with which the experiment is to be made, and varying in tint from pure white, through cream, grey-yellow, salmon, brown, &c., on to black, laying them side by side, and placing on each a similar print. The result of a careful examination of such an arrangement would lead, we think, not altogether, perhaps, to the abandoning of the use of pure white mounts, but would nearly lead to that consummation, and probably, also, to the discarding of those of more pronounced colour. From a careful examination of such an experiment we have no hesitation in saying that, for all ordinary photographs, a mount of a neutral, greyish tint is to be preferred to all others, and the more free from ornament or pictorial design the better. Especially do we object to lines or devices on the front; in fact, nothing, except perhaps the simple name either of the photographer or subject, should ever be allowed to have a place there.

Not less important, we think, is the material of which the card is made. The highly-enamelled or glazed surface is utterly out of keeping with the print, and is not only unpleasant to handle, but detracts from the *tout ensemble*, leaving the impression that the print has been put on to improve the card, rather than the idea that the card is there merely for the benefit of the print. While, however, the card should not be enamelled, it must be of the very finest quality of plain paper, and equal in finish to the very highest of what is known as "Bristol board." Neither do we object to the mounts being got up with all the elegance of the decorator's art, provided always it be kept in good taste, and that the decoration be subservient to the main object, namely, the print.

One of the best examples on our table of an admirable mount is one of about five-sheet board, of a fine, rather warm, neutral grey, rounded at the corners, and gilt on the edges. It has nothing on the back, and on the front simply the name of the photographer and the town, in gold letters. Such a mount is necessarily somewhat expensive, but we are quite certain that it pays in the end. We believe that the public generally have more good taste, and a better appreciation of what is æsthetically correct, than it gets credit for, and we have no doubt that those who take that fact into consideration and do their best to gratify it will reap the desired reward.

What we have here stated applies principally to *carte* mounts, but also, though in a lesser degree, to mounts of larger size, both in portraits and landscapes. The large white margins, although quite in keeping with engravings in black and white, are decidedly injurious to the warmer tints in which photographic prints are usually produced. They lower the tones, and tend to impart a feeling of flatness to what, when placed on a properly-toned mount, would be a rich, vigorous picture.

We hope photographers generally will lay this matter to heart, and we have no doubt that the discriminating portion of the public will not fail to appreciate a true desire to improve the appearance of the finished print in such a generally-undervalued particular as the mount on which it is placed.

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In another column will be found details connected with researches of great interest made by Mr. M. Carey Lea, whom we cordially welcome back to our pages after an enforced absence from ill health. The difficulty of getting iodide of silver coaxed into emulsifying with collodion is proverbial. The iodide forms readily enough; but down to the bottom of the bottle it will fall, doggedly declining to take up any loftier position. The remedy for this determined proclivity for precipitation which Mr. Lea has discovered must create astonishment from its simplicity. The emulsifying of the bromide is one of the simplest operations in the chemical manipulations of photography; but in the case of the iodide, as Mr. Lea justly observes, it at once sinks to the bottom in a half-crystalline, half-curdy form, than which nothing can look more unpromising. And yet all that is necessary to induce such physical changes in this precipitate is to give it a good shaking, by which simple operation its crystalline character is lost, it passes into a state of minute division, and remains in suspension in the collodion. We commend Mr. Lea's article to the careful perusal of our readers, who will be gratified to find that henceforth there will be no difficulty in emulsifying ordinary commercial bromo-iodised collodion.

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## EMULSIONS OF IODIDE AND IODO-BROMIDE OF SILVER.

Iodide Emulsions.—It has always been considered that, whilst silver bromide and silver chloride could be easily emulsified, no satisfactory and useful emulsion of the iodide could be obtained. M. Gaudin, indeed, who was the first to propose to emulsify a silver haloid under the name of "*photogene*," speaks of having experimented with an iodide emulsion; but during the fourteen years which have elapsed since his publication the matter has been laid aside as being virtually impracticable, and there has been a general conviction that when silver iodide was formed in a collodion it presently fell to the bottom, and could at best be kept only very transiently and imperfectly in suspension. Nor is it difficult to explain this belief; for if we add a silver solution (especially if it be in excess) either to a simply iodised or to an iodo-bromised collodion the resulting silver salt falls at once to the bottom—so completely that often the supernatent liquid is perfectly clear and transparent.

Some investigations in which I have been engaged during the past months on the action of light upon the silver haloids brought to me the conviction that it would be highly desirable to obtain emulsions of silver iodide and of mixed iodide and bromide; and I determined to try whether or not conditions could be found under which this would be practicable. I first found that by introducing certain substances into the collodion (turpentine, oil of cinnamon, &c.) I could get good emulsions; and, next, that these substances could be perfectly well dispensed with, and that, in fact, the difficulty of emulsifying silver iodide was purely imaginary. When we add a silver solution to a bromised collodion, and shake slightly, we get an immediate emulsion. When we do the same thing with an iodised collodion we do not get an emulsion; the precipitate goes to the bottom in a half-crystalline, half-curdy form, and on the sides of the bottle we find a clear liquid interspersed with distinct flakes of silver iodide. Nothing can look more unpromising; and yet it only requires a little sharp shaking (two minutes' shaking is more than sufficient) to bring this mixture into a perfect emulsion.

The change which takes place in the precipitate is very remarkable. It entirely loses its flaky, crystalline character, and passes into a state of exceedingly fine division. This change of physical condition is marked by a change in colour also. The precipitate which falls to the bottom (in case silver has been added in excess) is of a strong yellow colour, whilst the emulsion is perfectly white. If the liquid with the first precipitate—that which fell to the bottom—be poured out on glass, we have a granular, strong yellow film. Two minutes' shaking brings this mixture into an emulsion, which, if poured out at once on glass, gives a film as white as a sheet of white paper. By standing the emulsion quickly acquires more body, and in half-an-hour or less gives a cream-coloured, or even a pale yellow, film.

These films are as fine and as uniform as the bromide emulsions now in common use, and form very interesting subjects for experiment. An iodide emulsion has, in fact, several marked advantages over one of bromide. It is well known that silver iodide is much less exposed to blurring than bromide, whether arising from irradiation or from reflection from the back surface, so that with silver iodide, a backing is scarcely necessary. Again: silver iodide is formed with much greater rapidity than the bromide, so that one is not obliged to wait for the emulsion to acquire sensitiveness. In fifteen minutes after adding the silver an iodide emulsion is ready for filtering. It runs easily and rapidly through the filter, and may be coated immediately. Iodide emulsions seem to have no greater tendency

than those of bromide to settle. The silver salt seems to remain indefinitely suspended in the liquid. I can see little difference in this respect between it and bromide.

The rapid formation of the iodide, and the practicability of using it almost as soon as mixed, is a very decided advantage. Some persons object very much to an emulsion which needs to be used ten hours after mixing, inasmuch as in the interval circumstances may arise which will render this disposition of the time inconvenient. It is true that with the albumen bath and the plunging of the plate directly into it, in the manner which I described in your columns early last summer, this difficulty scarcely exists, as the emulsion may be used even after several weeks. Nevertheless, it will be held to be a convenience to have an emulsion which can be used a few minutes after mixing.

*Process.*—I have used ammonium iodide in my experiments, seven grains to the ounce of collodion, sensitising with twelve grains of silver nitrate dissolved in alcohol. It has seemed to me that after six hours' standing the emulsion scarcely gave as good results. Not that there was any loss of sensitiveness, but there seemed to be more trouble in getting density, which seems the chief trouble with iodide emulsions.

In using silver iodide unmixed with bromide I have preferred, instead of adding *aqua regia* to the collodion, to acidulate the preservative bath with acetic acid. Not much is required—perhaps half-an-ounce of acetic acid to five ounces of bath. This refers to the commercial acid known here as "No. 8," and which nearly corresponds, I believe, with your "Beaufoy's," and is, of course, not nearly so strong as glacial acetic acid. It is scarcely necessary to say that if a plate made with collodion containing an excess of silver, and no *aqua regia*, be plunged into a neutral preservative bath containing gallic acid it will fog.

For a preservative I prefer the bath I have already referred to, and which is made as follows:—To eight ounces of water add an ounce of strong, thick gum arabic solution (the exact strength is not important) and half-an-ounce of prepared albumen made by beating up white of egg with its own bulk of water, adding five minims for each egg of the same acetic acid above mentioned, and half-an-ounce of sixty-grain solution of tannin. The different ingredients to be added in the order above mentioned. Some gallic acid (a quarter of an ounce of sixty-grain alcoholic solution) may be added or omitted according to the preference of the operator. If added, it should come next before the tannin solution. If these ingredients be added in a different order from that named they are apt to produce a curdy precipitate which would destroy the qualities of the bath even if filtered out from it.

The alkaline development succeeds better than the acid, if the ordinary exposure have been given. But this alkaline development requires a somewhat different management from that of bromide plates. No restraining agent is needed; the film may be treated at once with pyrogallic acid and ammonium carbonate. To add any potassium bromide would be not only useless but injurious, as there is not the least tendency to fogging. For the same reason ammonium carbonate may be more liberally used than with bromide plates. If sufficient density be not obtained by the alkaline development the plates may easily be redeveloped with silver in the ordinary way.

As to the question of relative sensitiveness, that is one of which I am hardly able to speak as yet. The plates certainly exhibited a high degree of sensitiveness, but whether as high as that of the best bromide plates I feel some doubt. In fact, the field presented for experiment by this emulsion and by that of mixed iodide and bromide, of which I shall presently speak, is so vast and varied that as yet I have only fairly entered upon it. It will, doubtless, tempt many to experiment, and develope many useful results.

There is no doubt in my mind that the iodide plates will be greatly improved by adding silver chloride to them. From chloro-iodide plates good results may be reasonably expected. I have not as yet tried them, because my attention is at present devoted to emulsions containing iodide, bromide, and chloride, from which interesting results are likely to follow.

*Iodo-bromide Emulsions.* — Collodions containing iodides and bromides emulsify very easily with silver. There is the same appearance as in the case of iodide alone. The silver salt formed goes to the bottom at first, and looks almost hopeless; but a short and brisk shaking disseminates it through the liquid, and a faultless emulsion results, with no disposition to settle. I have not only succeeded in emulsifying my own mixtures, but, finding in my laboratory a bottle of commercial iodo-bromised collodion intended for portraiture, I found no difficulty in making it emulsify, and it yielded a highly-sensitive film.

By the addition of a chloride, so that the film contained all three of the silver salts, I found a farther gain in sensitiveness. Next week I shall be ready to send some details of this process. Meantime I put on record the observation that *iodo-bromide films and, even more, chloriodo-bromide films very distinctly exceed simple bromide films in sensitiveness*, even the most sensitive bromide films yet obtained, and may hereafter, when fully studied, be destined to take their place.

The application of this new method to Mr. Bolton's pellicle process and to the gelatine process is sufficiently obvious, and the sensitiveness of the emulsions used in these operations can, doubtless, be materially heightened by adopting the principles here communicated.

M. Carey Lea.

## A FEW WORDS OF TRIBUTE TO THE MEMORY OF MR. O. G. REJLANDER.

It was with much grief that I heard of the death of Rejlander. He was an artist in every sense of the word, and I felt for himself and for his works much sympathy.

Unfortunately I had not the privilege of being intimately acquainted with Rejlander, but, from what I have known and heard of him, I could not speak otherwise than highly concerning him. His character—so gay, lively, and expansive—manifested itself quickly and enabled me to appreciate readily the genius and the heart of that good man. I remember that in 1868, during a short visit to London, I was taken to his house by one of our mutual friends. He was working then in a very modest *atelier*. He received me as an old comrade, and left off his work to devote himself entirely to me. Knowing a little of the German language I was able to enjoy his picturesque conversation, which interested me greatly. He opened his portfolios and drawers, and, having produced a number of proofs, in an impulse of enthusiastic generosity offered me the whole of them. "Take them," he said; "they are yours if you feel any friendship for me." I thanked him heartily for his cordial reception of me, and remember that I had to exert all my energy not to accept more than ten proofs from that interesting collection.

Two years later I paid another visit to London, and then found Rejlander in a comfortable and elegant studio. But he was still the same man—good, simple, spontaneous, and always original.

I have preserved with precious care the proofs which were given me by him. I shall look upon them often to find him in them, as I knew him when living and full of imagination.

The death of this artist will long leave a great void in the ranks of photography. For my own part I shall never cease to regret this man of heart and talent, removed, whilst still in his prime, from his art, his family, and his numerous friends.

Adam-Salomon.

## NEW EXPERIMENTS IN PHOTOGRAPHY.

Some years ago I frequently called attention in these pages to the value of the glycerine process, to enable wet plates to be kept without deterioration for a considerable length of time. In the course of some recent experiments not directly connected with photography. I discovered that the proximity of solid objects to the glycerine plate in the dark, exerted an action upon it which became visible on development. Bromo-iodised collodion was used, and the nitrate bath consisted of thirty grains of nitrate of silver and one drop of acetic acid to each ounce of distilled water.

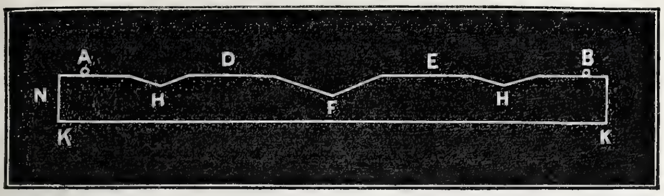
The preservative solution was as follows:—

| | |
|---|---|
| *Pure* honey | 1 ounce. |
| Glycerine | 1 ,, |
| Nitrate of silver | 10 grains. |
| Kaolin | ¼ ounce. |
| Distilled water | 15 ounces. |

This was shaken up and exposed in a bottle to diffused daylight—not sunlight—for two days. The upper portion of the solution was then filtered into a glass bath for use. A protosulphate-of-iron developer was used, and the plates were fixed with a saturated solution of hyposulphite of soda.

I took a piece of wood of the shape shown in the accompanying diagram. The length KK was eight inches; the thickness N about three-quarters of an inch; and its breadth three inches. Triangular pieces were cut out of its upper surface from side to side, so as to leave the depressions shown in the cut. The depressions H H amounted at their greatest depth to a quarter of an inch; the central depression F was half an inch deep. The flat elevations D E had exactly the same level as the elevations A B. The little circles

under A B are pieces of very thin string; in fact, each piece of string was only about twice the thickness of common twine, consequently when I laid a stereoscopic plate face downwards, and




resting at each end upon these pieces of string, the sensitive surface of the plate was but an infinitesimal distance above the level of the flat surfaces D E. The surface of the wood was blacked to prevent reflection.

The plate was left upon the piece of wood for two hours, during which time the weak light of an adjacent paraffine lamp was allowed to act upon the film through the upper or back surface of the glass. On developing, the shape of the rectangular surfaces D E became visible by the increased silver deposit at their edges. Consequently, upon this plate there were six dark lines with diffused edges running across the plate from side to side.

I have substituted iron for wood in other similar experiments with the same results, except that in some instances there is less photographic action over the centres of the elevations D E than over other parts of the plate, the dark lines being visible as before.

I presume these effects to be due to the checking of the evaporation from the surface of the wet plate at those places where the wood is in close proximity to it but does not actually touch. But I do not commit myself to the accuracy of this explanation. I am not able at present to satisfactorily account for the dark lines with diffused edges produced where each depression begins.

On performing the same experiment, but with a glycerine plate raised to the level of a quarter of an inch above the surface of the wood, the ridges have no influence upon the film. The results are somewhat different from what might have been expected. One would have thought that the checking of evaporation would tend to increase the sensitiveness to light of that part of the plate. It may be that in this case the glycerine plate acts either more like a dry plate, or that somewhat rapid evaporation from wet plates directly they are prepared tends to increase sensitiveness. When plates prepared in the way just described were left in the dark for from twelve to eighteen hours before use, on developing them they had many of the characteristics of dry plates. They were nearly dry to the touch, and the film had a tendency to come off the glass in the washing operations; whereas, when they were used fresh, the film adhered most tenaciously to the glass before development. Those which were almost dry I hadto dip once more in the glycerine bath and to leave them there for five minutes. It would seem that these plates are practically the same as wet plates if used immediately, but that they slowly change, hour by hour, till at last they acquire some or all of the photographic characteristics of dry plates. Although they contain free nitrate of silver, they develope, after eighteen hours' keeping, free from fog. As these slow changes may be carefully studied by developing plates after different times of exposure, apparently they open a good field for studying the philosophy of the difference between wet and dry plates. There must be one particular time after their preparation when they cannot properly be characterised either as wet plates or dry plates.

These experiments show that if the shutter of a dark slide fall but a small distance in front of a wet plate it may lessen the sensitiveness of that plate; also, that any prominences or irregularities on the inner surface of the shutter may produce markings when the picture is developed. These effects appear to be caused by unequal evaporation. William H. Harrison.

## SUNDAY PHOTOGRAPHY.

It must, I think, have been observed with regret by most of the followers of our art that, throughout the country, portrait-taking on the Sabbath-day has been very much on the increase during the last three or four years. Photographers generally must have been struck by the growing demand there has been for appointments on the Sunday; moreover, the advertising columns of this Journal have clearly testified to the fact that Sunday work has become openly common.

In venturing to draw attention to this matter of Sunday work in connection with our art I have no wish to start a religious controversy; my object is, with the Editors' permission, to ask the several photographic societies of this country to take the subject into their serious consideration, with a view to uniting their influence in opposition to a practice that threatens, if not resisted, to drive from the ranks of photography the more conscientious men, and to bring into hopeless slavery the less scrupulous who remain.

Competition in our craft is not less sharp, active, and overreaching than it is in other branches of industry; nor are those wanting amongst us who do not hesitate to employ the Sabbath in order to procure an advantage in the contest. Now this is obviously unfair to the law-abiding craftsman, whose conscience will not allow him to do likewise, therefore he may with good reason protest against it.

I do not know whether or not it is legal to publicly practise photography on the Sabbath-day in this country. If it be not legal, there is a very strong case against those who do so practise the art. If it be legal, why, of course, there is no case against them on that ground; but, on the grounds of health and morality, there is a very serious charge to be brought against the Sabbath workers, because they are not only injuring themselves, but helping to establish a custom that must ultimately deprive their fellow-workers of the rest which is so essential to the well-being of all.

It would be out of place here to attempt to adduce proofs of the bad effects of Sunday work upon health and morals. The general question has been fully discussed, and most thinking men are satisfied that a day of rest is an absolute necessity for the happiness of man in this world of toil. I will, therefore, conclude with a humble appeal to photographers and their assistants to resist the practice in every proper way, because it is wrong and not profitable. The poor assistant who labours seven days gains no more than the one who works only six; and the very unwise photographer who robs himself of the rest of the Sabbath must, in the end, find that he has only obtained in seven days that which he might have gained in six had he been content to do it. W. Hanson.

## AN ACTINOMETER.

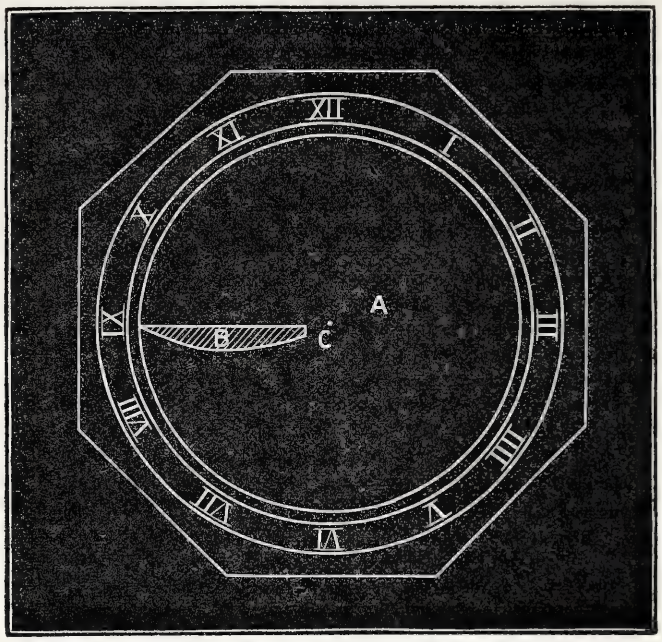
A want is often felt, when accounts of extraordinary rapidity obtained by some experimentalists are recorded, of some means of comparison —a sort of foot-rule that can be laid down and an accurate comparison of results made. It is not sufficient to give the focal length and diameter of stop, inasmuch as an element of so variable a nature is introduced that, unless some method of measuring it be at hand, no correct comparison can be made. If I am told by a person in Paris that his exposure is one second, how am I to know that, in assuming his results to be different to mine, such discrepancies are the result of a superior method of working, or merely owing to a more actinic light enjoyed by him? Clearly here is a quantity introduced that as yet I have not seen any reliable data given in reference thereto in any experiment on record.

I have had a very striking illustration of the necessity of such a piece of apparatus. Some time ago I made a little instrument to estimate the actinic value of daylight. I took one described in your last volume, page 51, because of its superiority to any I know of, and for its properties I must refer your readers to the article in which they are explained. Having occasion to set it in motion a few days since for a purpose not of much interest to your readers—the observation, so far as photography is concerned, being the fluctuation of actinic power from nine a.m. to three p.m. The wave appeared to have no regularity, but to dance about like the wave on the sensitive sheets produced by a barograph in squally weather. Usually you would not have expected such variations, and, as the elevation was about six hundred feet above the sea level, with no wind a steady light might have been expected. Under circumstances like these it is obvious that any experiments, say on comparative rapidity, would have been very conflicting indeed.

At the present time we are being deluged with "new lights" from "old ones," and the next thing in this line will be the "light of other days" burned in a jar of oxygen, and enabling the photographer to work at night, not at next to nothing, but considerably the other side thereof. Ultimately the government will build studios on the dangerous parts of our coasts to take the place of lighthouses, and in the charts we shall see marked "steady white light from the studio of Mr. Jones, lat. 40° long. 30°." But, to cease bantering, I simply want in passing to draw attention to the fact that illumination and actinism do not necessarily go together, and it is the latter quality photographers chiefly want. The illuminating power is not very difficult of determination. No more is the actinic; but I must confine myself to the means of estimating the actinic value of daylight, and leave those who choose to apply the principle to artificial light.

The apparatus, of which a diagram is subjoined, consisted of a clock, a disc of blackened metal with an aperture cut therein of such a shape as before mentioned, and from what has been said it is

obvious that such an arrangement will produce a series of tints having numerical relation to each other and suitable for comparison with any other experimentalist, provided a standard material upon which the light acted could be produced. This Dr. Roscoe, in his




A is a disc of metal covering the face of the timepiece as far as the figures. B, aperture in the disc through which the light passes upon the sensitive material, which material is fixed upon the clock face. C, spindle to which the disc A is attached; this spindle may be the hour or minute. Of course the dimensions of the aperture would in these cases vary.

researches on the chemical intensity of daylight, proved to be quite possible in the case of chloride of silver; in fact, he used it in his pendulum actinometer.

So all that is required is to elect some given standard of comparison —say a precipitate of a light colour—and compare the tints given in the actinometer with it in a monochromatic light, and when the distance from the centre of the portion of the tint (corresponding with the standard) be given, along with the dimensions of the aperture and the speed the disc revolves, full data would be in hand for the comparing of results with any other station and at any distance.

A little instrument might be made with the works of an old verge watch and would be very portable. Should this or any other form of actinometer be used it is beyond all question that, until a reliable method of comparison be made, no value at all approaching scientific accuracy can be given to any experiments in which actinism is a quantity, and which are performed at intervals or at distances apart.

W. E. Batho.

## LIGHTING.

It is patent to all that the actinism of light varies and its chemical effects are not identical when obtained respectively from the four cardinal points. It will, therefore, be obvious that definite rules as regard lighting which shall apply to all alike are impracticable. The particular "local" light (if I may be allowed the expression) must be the individual operator's study.

Take the case of two *ateliers*. In the one an almost absolutely pure white light is obtained, and in the other one of a yellowish hue. Assuming the conditions of the chemicals to be precisely similar, and equal volumes of light be obtained, to attain a similarity of result a wide difference in the illumination of a given subject in the two *ateliers* will be perceptible. In the case where the light is purest it is found that the shadows partake of a bluish tint, consequently considerable contrast in illumination must be obtained, otherwise a flat, lifeless image will be the result. In the other, where the light tends to yellowness, a marked dissimilarity is observable in the shadows and general appearance of the image; the shadows partake of a deep yellow hue, approaching brown, which require considerable relief (from reflectors or other approved means), and which would appear to an inexperienced eye absolutely flat.

To those who have studied and observed the action of the prismatic colours upon the sensitive plate, the cause of variety of treatment will be perfectly well understood. In the first case the shadows partake of the very actinic tint, "blue," which necessitates bold and vigorous illumination to obtain an image with sufficient contrast. In the other the shadows are very non-actinic; they, therefore, must be relieved to a considerable degree in order to get sufficient transparency, solidity, and softness of shadow.

I have assumed that the variety of action produced by light from the four cardinal points were obtained in *ateliers* similar in construction and in the angle and volume of light obtained. We find in practice that locality (explaining the term I have just used) has great influence as affecting the actinism of light. To explain: one *atelier* has a large volume of side light, another top light; and again, the atmospheric media differ considerably (especially in our large manufacturing centres), all apparently the veriest trifles, yet each producing dissimilar results. Hence comes the necessity of individual study and effort; as so great a difference is observable the particular light must be a special study. The primary canons relative to the effects (chemical) produced by the action of light are undoubtedly necessary to arrive at correct conclusions; but this must be combined with a thorough practical experience to attain excellence.

The chemistry of the profession also requires study and attention. The perfecting of all the studious care bestowed upon the posing and illumination of a subject depends entirely upon its subsequent chemical treatment. The chemicals are subject to great variety of changes, producing a like change in chemical action. The study of them, under these varied aspects, is, therefore, imperative. Chemicals properly balanced, manipulation, and skill, combined with accurate judgment of effect, are absolutely necessary to true success.

William Schmidt.

## NOTES ON PASSING EVENTS.

By a Peripatetic Photographer.

In speaking of the Silber lamp in a recent leader the Editors alluded to their having screwed the burner into a flat and shallow reservoir, so as to tax to as small an extent as possible the capillary powers of the wick. Those who possess a lamp of the kind mentioned cannot have failed to notice that in proportion as the oil falls in the reservoir so does the brilliancy of the light become impaired. To remedy this I had the burner mounted in a manner similar to that of the well-known fountain lamp for burning fixed oils. The result of this was that the level of the paraffine oil supply was very little below the burner, by which means a large quantitity of oil was supplied owing to the high level at which it was carried up into the burner, and thus allowing the capillary or suction powers of the wick very little work to do. Those who desire to see an argand paraffine lamp working at its best ought to try this modification. By employing a piece of soft yet stiff pewter pipe to connect the burner with the reservoir the best height at which to place the reservoir may be accurately determined by experiment.

We want some new test for hyposulphite of soda by which we shall be enabled to distinguish between that body and sulphurous acid. If it be correct, as you say it is, that the iodide-of-starch test for hyposulphite also applies to sulphurous acid, and if it be further correct that both these substances are occasionally, if not frequently, to be found present in the mounting boards of our pictures, a simple discriminating test by which we shall know one from the other will be appreciated by your readers. That both are bad no one doubts; but still it would be consoling to know whether our pitcher got broken by means of a brickbat or by the kick of a passing miscreant.

When I read the letters which have appeared on the subject of "Sutton's patent albumenised paper," I found myself inquiring whether or not it is used by any one at present. As the patent expired many years back I can discuss this subject without militating against any vested interests. The invention was one for retaining the albumen on the surface of the paper so as to ensure the greatest possible amount of glossiness; and this was effected by the paper being made to receive a preliminary coating of india-rubber varnish as a substratum for the albumen, which was thus unable to penetrate into the paper. Several years ago, when an attempt was made introduce india-rubber varnish or paste as a medium for mounting prints, it was found that a thin film of rubber sooner or later became disintegrated and resinified, losing all its cohesion; and from this rotting of the paste the latter soon became a thing of the past. If india-rubber behaved so in the latter case it would also, in all probability, behave no better in the former, and hence may have arisen the dislike to using it. The method of double albumenising which was presented to the world several years since, and which is now extensively employed when papers having a more glossy surface than usual are required, appears to fulfil all the requirements necessary, while at the same time it is free from any drawback. Of course, in writing this I do not commit myself to any opinion respecting the superiority of a glossy over a dead surface, or *vice versâ*.

I advise all those who are about to purchase a thermometer to do as I did, viz., select one that has a Fahrenheit scale on one side of the tube and a Centigrade scale on the other. I have several thermometers of this kind, and I find a great convenience arising from their being graduated in this way, as it saves all the trouble otherwise required of converting by a process of calculation any degree of temperature by one scale into that of the other. This note is *apropos* of Mr. G. W. Webster's article on *Heat Measures,* in which he gave the rules for effecting the conversion of Centigrade into Fahrenheit.

Mr. Glaisher, it appears, is to resume his vacated seat as president of the London Photographic Society. He accepts the new order of things, viz., a yearly tenure of office; a seat with members of the Council elected by the body of members and not the mere nominees of the Council; and several of his quondam supporters absent from their accustomed places at the Council board—at which, however, are to be found several with whom he had expressed his determination not to sit. It shows the great interest Mr. Glaisher feels in the Society when he signifies his willingness to become president under a state of things somewhat allied to that curtly described as the eating of "humble pie."

By the introduction of Despaquis' patented method of producing *lichtdrucks* by means of the steam press, collotype may prove a formidable opponent to the Woodbury process as a means of producing prints in large numbers for book illustration or other purposes in connection with publications. What the new means by which he is enabled to do all that he avers remains yet to be seen; but as his term of provisional protection has not yet elapsed, we must just bridle our impatience as best as we can until his patent specification is accessible to the public. It is said that he effects a complete chemical change in the nature of the gelatine printing surface. From this it would appear as if he hardened his film by other means than those usually employed, such as treatment with alum, tannin, or the alkaline bichromates. The great value of his invention will depend not so much upon whether a thousand prints can be obtained from a printing film, the last being as good as the first, as whether good prints can be produced in *much* less time than at present. Collotype printing is rather a slow process, and any means whereby it can be accelerated and simplified will be hailed with great pleasure.

(*To be continued.*)

## KEEPING QUALITIES OF THE PELLICLE EMULSION.

[A communication to the Liverpool Amateur Photographic Association.]

In accordance with a promise made at our last meeting I now wish to make a few remarks on the keeping qualities of pellicle emulsion prepared by Mr. W. B. Bolton's process.

It will be remembered that at the April meeting of our Association last year I exhibited two transparencies produced by means of this process—one of them upon a plate prepared the previous January, the other upon a plate made from the same batch of emulsion used on that occasion, and which had in the meanwhile remained in my possession untouched, being at the time eighteen weeks' old.

A few evenings since I again tried this old emulsion, and the results are now before you. The conditions observed were as nearly as possible similar on each occasion, the same negative having been used and the same exposure to gaslight (ten seconds) given. No gold was used for toning. The results, upon comparison, are as good as the previous one.

The emulsion has not deteriorated in the slightest degree. A slight opalescence is observable upon drying the plates, but this may arise from the ordinary decomposition of the pyroxyline, which takes place with even plain collodion; or it may be caused by some chemical action traceable to the organic matter used in the emulsion, which, in this case, consisted of tannin, soap, and sulphate of quinine. The latter substance has since been found to exercise a very powerful effect as a restrainer, and it is very probable that its action does not stop there.

The plates prepared from this particular emulsion exhibit now, as previously, a tendency to slowness in development, but in that respect are in no way different to what they were thirteen months since, thus proving that no chemical change has taken place in the emulsion itself.

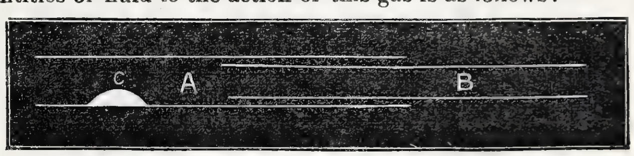
This, I think, fairly shows that the emulsion is possessed of satisfactory keeping qualities. Holding in view the additional twelve months' experience gained, and recent improvements in the details of the process, I think it holds out a fair prospect that a sensitive emulsion may be made which will retain all its good qualities as long as ordinary bromised collodion, or, indeed, indefinitely.

These remarks refer simply to the sample of emulsion I have had in my possession since January in last year, before the process was published by Mr. Bolton. Since that time improvements have been made in the details of the process, but the unchangeable nature of this preparation is, I think, established. The pellicle previous to solution will undoubtedly keep indefinitely. WM. ATKINS.

## ON THE USE OF PHOTOGRAPHIC AND CHEMICAL APPARATUS.

CHAP. X.—PREPARATION AND USE OF GASES.—(Continued from page 79.)

SULPHURETTED HYDROGEN.—This is prepared in the same manner as hydrogen, small pieces of sulphide of iron being substituted for the zinc; but, as it is a most noisome gas, possessing also poisonous properties, a very small quantity of acid should be added when it is required for testing only. The Woulff's bottles could here be used with more advantage for preparing the gas, as the larger corks would be more likely to be acted upon and destroyed. Another arrangement for holding the funnel and tube is an india-rubber cap with orifices provided with short rubber tube for receiving them. The cork or bung, again, may be replaced also by one made of india-rubber, which can be bought with holes ready pierced. The caps also may be obtained with one or more tube orifices. If the safety tube shown in the diagram be adapted to this apparatus not a trace of the gas will escape into the room. This gas is constantly required in laboratory work, and many means have been devised for producing a supply of it at will, without any disarrangement of apparatus beyond the turning of a tap or opening of a pinchcock. Some answer the purpose well, but do not come within the province of these chapters. When testing small quantities of liquid a very small apparatus may be made use of. A bottle or flask of about an ounce capacity, having no funnel and provided with a tube bent twice at right angles, so as to point downwards for immersing in test glasses, will suffice, the materials, of course, having to be mixed before putting in the cork with its tube. If the sulphide be put in in two or three large lumps the evolution of gas will be proportionately slow. A very neat and convenient way of submitting small quantities of fluid to the action of this gas is as follows:—

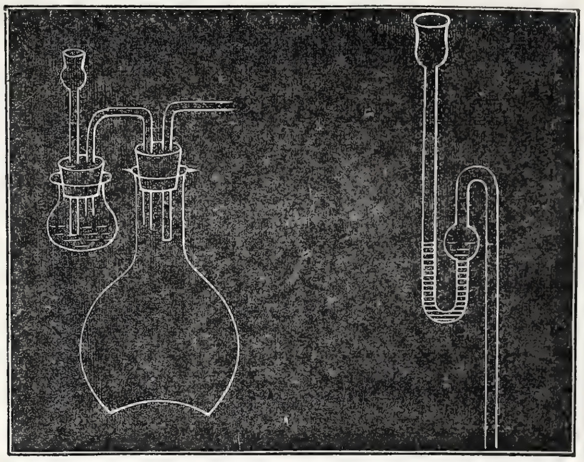



B is a tube sliding into A; *c* is a small quantity of a mixture of bisulphate of potash and sulphide of calcium in the proportion of three to one. The outer end of tube B is dipped into the fluid to be tested and withdrawn, a slight film being left on the inside of the tube. Tube A is slightly warmed at *c*, and the gas is formed. If it be now blown through the gas is carried forward, and acts on the film at the end of B, the usual reactions being readily seen.

*Carbonic Acid* is of less frequent use than the latter; it is required in testing for lime, &c. In all essential particulars the description of the hydrogen apparatus will serve for carbonic acid, pieces of marble and dilute hydrochloric, in preference to sulphuric, acid being the materials used for generating the gas.

*Chlorine.*—This gas requires still more care in its production than the sulphuretted hydrogen, the inhalation of a very small amount being sufficient to cause acutely-painful sensations. In case of any accident so occurring it is well to know that the vapours of hot water inhaled is the best remedy, and the addition of a few drops of ammonia renders their effect still better. Hence great care must of necessity be exercised in all experiments with chlorine, and it is imperative that all waste be carried into the open air by one means or another. It is usually made, on the small scale required for experimenting, from a mixture of powdered oxide of manganese and hydrochloric acid, the application of heat being necessary for its evolution. If the acid be used strong the gas is produced quickly, and *vice versâ*. It is best made in a retort or a flask with india-rubber connections, as corks would be destroyed most rapidly when subjected to its action, this gas being of such a corrosive nature. The beak of the retort or end of the delivery tube, being immersed in water during the delivery of the gas, must be instantly withdrawn upon the source of heat being taken away, or the sudden cooling that would occur would cause a contraction of volume in the gaseous contents of the retort, and the fluid would rush up the tube and enter the retort, causing its destruction and the escape of the fumes into the atmosphere of the apartment. Similar precautions are also required in the cases of very soluble gases.

In important operations, and, indeed, in all cases, it is desirable to provide against such contingencies as want of attention at a critical moment, and to meet the case in point safety tubes of various kinds have been devised. In most cases the thistle funnel shown in the hydrogen apparatus is sufficient; but it is only applicable when the gas is generated from liquids. A form still more generally useful is one with two bends and a bulb, as shown in the diagram. If



the bulbed tube be difficult to make or obtain it may be replaced by a small bottle, as shown in the diagram, the liquid shown in each being either water or mercury. When, through the withdrawal of heat or the absorption of a soluble gas, the pressure in the generating vessel becomes less than that of the atmosphere the latter will, in the safety tubes, drive the liquid before it and gain admission until the pressure is equalised. If, on the contrary, the pressure inside become too strong the liquid will be driven outwards through the tubes, overflowing in the thistle funnel and remaining in the bulb in the other form shown, which is merely one of many.

*Oxygen.*—Little need be said of this gas, it has so often been treated of in these pages. The precautions to be taken are the same as with the last-named gas, with the exception that there is no danger to be apprehended from its dissemination through the apartment. In making a quantity the chief points are the ensuring of complete freedom from deposits or obstructions in all the joints and connecting tubes, and the due admixture of the proper proportion of pure ingredients, the application of a steady, and not too intense, heat—the heat of a Bunsen's burner—being quite sufficient to decompose a large mass of material. G. Watmough Webster, F.C.S.

## FOREIGN NOTES AND NEWS.

To Procure a Durable Silvered Paper.—Wunder's Colouring Process.—The Protection of Pictures by an Insoluble Size.—Transferring Negatives by Means of Talc.—Useful Formulæ by M. Davanne.—Adhesive Cement.

At present there are but two known methods of producing a durable silver paper without having recourse to fumigation, viz., by allowing the sensitised paper to float upon a silver bath containing citric or tartaric acid; or by bringing the paper, silvered in the usual manner, into contact with a solution of citric acid in water. The last of these processes, which was introduced by Mr. J. M. Turnbull, seems to be the best. It consists in allowing paper silvered in the usual manner to become half dry, and then floating it upon a solution of citric acid. It is somewhat difficult to do this successfully, as, if one bring the paper too moist to the acid solution, then the paper throws off too much silver salt and the prints are insipid; on the other hand, should the paper be too dry, it takes on the acid solution with difficulty and curls up.

To avoid these unpleasant results Herr Fritz Haugk recommends the use of alcohol instead of water for the solution of citric acid. He also allows his sensitised paper to become perfectly dry before coating it with the citric acid. His formula is 480 parts of alcohol to ten parts of pulverised acetic acid, and with this he obtains a paper that will keep with care from four to six weeks. This paper prints rapidly and brilliantly, and tones well in a gold bath made somewhat alkaline by the addition of bicarbonate of soda. Of course it is taken for granted that the prints are washed before they are immersed in the gold bath. Some papers, when they have been subjected to this process, acquire a slightly yellowish tone, but the soda bath generally corrects that.

Another topic treated of by Herr Haugk is Wunder's colouring process. He says it is very easily tried. The photograph to be experimented upon should be toned much darker than usual—to a bluish-black, in fact, rather than to a brown. After that, the print is fixed, washed, and dried in the usual manner; then it is made transparent by the following varnish:—

| | |
|---|---|
| French oil of turpentine | 90 grains. |
| Best mastic | 15 ,, |
| Venetian turpentine | 3¾ ,, |

When this is dry lay the photograph, with the face downwards, upon a piece of glass covered with white paper; place the whole upon the retouching desk, and colour the wrong side of the photograph with honey or common size-colour. In order to judge of the progress of the colouring the photograph may be lifted up from time to time and placed against a piece of white paper. When it is sufficiently coloured, coat the card upon which the photograph is to be mounted, with a solution of gum arabic; allow it to dry, and then repeat the process. While the second coating of gum is yet moist lay the coloured photograph upon the card, and rub it smooth with a piece of linen. When the whole is thoroughly dry, any gum that may be upon the edge of the card beyond the picture may be removed by a damp sponge.

In spite of the favourable reception Herr Wunder's process met with at first it has not been employed to anything like the extent anticipated by the inventor. Photographers, of course, only take up those inventions which seem likely to hit the public taste, and, consequently, which pay. This is just what Herr Wunder's process has not yet done; but it might be worth somebody's while to try further experiments with it.

An insoluble size, for protecting pictures, cards, &c., from dust can be prepared and applied in the following manner:—Take a quart of glue of such strength that it becomes in consistence like jelly when cool; and to that add a quarter of an ounce of ox-gall. Heat the mixture, and pour a little of it upon a glass plate, so that the latter shall have an equal coating of the mixture. After the coating has stiffened, lay the glass plate in a solution of argil; the size will absorb the argil, and thereby become insoluble. The solution of acetate of argil is prepared by the solution of one ounce of acetate of oxide of lead and one ounce of alum in a pint of water, and allowing it to throw off the envolved sulphate of oxide of lead. The plate may remain two or three hours in this solution, and then it must be freed from all the argilaceous salt, by rinsing and steeping in clean water.

The coating of insoluble glue should now be covered by a thin film of weak glue. The picture should then be moistened and laid face downwards upon the last coating of glue on the glass plate while the latter is yet damp. Care should be taken to rub the picture quite flat and smooth upon the gluey film. The wrong side of the picture can then be made dust-proof by the same treatment—with acetate of argil.

The glass plate should now be laid for three or four days in a warm room until the glue becomes completely dry; then take a sharp knife and run it round the edge of the picture; remove the picture from the plate, and you will find that the gelatinous film comes with it. This film can be coloured if it be considered desirable. For this purpose, after the treatment with acetate of argil and the rinsing, lay it in a colour bath until the desired shade be attained. For colouring red use cochineal or Guinea red wood, and for blue indigo and carmine may be used.

Photographers often meet with apparent inconsistencies in their art which they find it impossible to reconcile. Here is a case in point. The other day M. Portier, at a meeting of the Photographic Society of France, described a method of transferring a collodion negative from glass, by first rubbing the glass plate with powdered talc before collodionising it, and then pouring a solution of gelatine over the finished negatives; the compound film could then be easily removed from the glass when it had set and become cold. On the other hand, M. Chardon stated that when he took Taupenôt negatives upon talc, or upon glass rubbed with talc, he found the film to be unusually adhesive and free from blisters. Thus it would appear that what causes the *non*-adherence of the film to the glass in one process causes its *greater* adherence in another process. Is this really true? And, if so, what is the cause of the difference between the two results?

The writer had once the opportunity [of seeing] the process of transferring a negative by means of gelatine performed in M. Davanne's studio by one of the leading members of the Photographic Society of France, who had adopted carbon printing exclusively, and

who treated all his negatives in this way with reference to that process. His success was complete, and the transferring process seemed to be in his hands a matter of absolute certainty; but it was by no means the simple dodge which some writers make out. The impression produced by this experiment, and by the examination of a large number of transferred negatives, was that the gelatine film ought to be very thick, otherwise the negative is likely to cockle and get out of shape when preserved between the leaves of a book. It seems not unlikely that the transferring process might introduce distortion in negatives of architectural subjects, which would interfere with their utility and beauty.

Photographers who take an interest in the wet collodion process—and which of them does not?—will be glad to know by what formulæ M. Davanne has lately recommended in his lectures to compound the various solutions used in that popular process. We have already given his versions of the waxed-paper and Taupenôt processes.

Bromo-Iodised Collodion.

*Plain Collodion.*

| | |
|---|---|
| Ether | 600 cubic cents. |
| Alcohol at 40° | 300 „ |
| Pyroxyline | 10 to 12 grammes. |

*Iodising Solution.*

| | |
|---|---|
| Absolute alcohol | 250 cubic cents. |
| Iodide of ammonium | 10 grammes. |
| Iodide of cadmium | 10 „ |
| Bromide of cadmium | 10 „ |

Filter the solution, and to every ninety cubic cents. of the plain collodion add from ten to twelve cubic cents. of the iodising solution. A little iodine may be added—sufficient to give the collodion the colour of Madeira wine.

The following are some other useful formulæ:—

*Plate-Cleaning Solutions.*

| | |
|---|---|
| Water | 100 cubic cents. |
| Rotten stone | 25 grammes. |
| Nitric acid | 5 cubic cents. |

| | |
|---|---|
| Alcohol | 100 cubic cents. |
| Water | 100 „ |
| Marseilles soap | 50 grammes. |
| Rotten stone (after filtration) | 50 „ |

*Iron Developer.*

| | |
|---|---|
| Water | 1000 cubic cents. |
| Alcohol at 36° | 50 „ |
| Acetic acid, common | 50 „ |
| Double sulphate of iron and ammonia | 50 grammes. |

*Negative Varnish.*

| | |
|---|---|
| Alcohol at 40° | 100 cubic cents. |
| Shellac | 10 grammes. |

*Pyrogallic Developer.*

| | |
|---|---|
| Distilled water | 250 cubic cents. |
| Glacial acetic acid | 10 „ |
| Pyrogallic acid | 1 gramme. |

The *Bulletin Belge* contains the following formula for making an adhesive cement for labels of bottles, &c.:—Put into an evaporating dish 100 cubic centimetres of water with fifteen grammes of common glue (which should have been previously soaked in water for some hours), a little sugar candy, and fifteen grammes of gum arabic. Boil up together, stirring well. Apply the cement with a brush, whilst hot. A label coated with this will only require to be moistened, when dry, to stick with extraordinary tenacity.

## OUR CLUB.

No. I.—A New Washing Machine.—The "Imperial" Picture.

At the last meeting of Our Club there was on view a new washing machine, which, like many others of the smart things introduced into our trade, comes from America. It has been patented there since 1873, but, never having seen it before, and believing it to be to a great extent unknown in this country, I thought a short description of it might be of some practical value to many of the readers of the Journal.

This machine is composed of two cylinders, the one within the other. The outside one is made of tin, and is rigid, measuring twenty-four inches in length, and twenty-five inches in diameter. The smaller cylinder is fitted inside the tin one. It is just a framework of metal having a series of little knobs all round the metal rims on the outer edge. To these knobs is attached a thread, which is crossed and recrossed, round and round, until this interior cylinder looks as if it were fitted with fine thread network. There is a small door in the tin cylinder about five inches deep, opening all the way across, by which means you can arrange the thread should it get tangled or loose. A small tube, three-eighths of an inch thick, filled with little perforations, is fitted across the top of the tin cylinder inside, the perforations facing the network. Another tube of the same diameter, also perforated, runs through the centre of the thread cylinder.

An iron stand on either side supports the machine. A hole drilled through this stand, on the left, supports and keeps the centre tube firm; for it is not fixed at the other side of the cylinder, but stops within a quarter of an inch of it. As this interior cylinder is rotary a small handle is attached to the other side of it, by which it is sent round.

It will be perceived that we have but to attach an india-rubber tube to the tap and make a connection between it and the top tube on the right-hand side, and by this means the water will pass through the top tube to a coupling between the top tube and the centre one, on the left, the extreme end of which is closed up. Thus a continuous spray of fresh water for the prints will be procured.

After the prints are fixed they are immersed in water, and then taken out and laid side by side in the interior of the thread cylinder, which, when filled, will hold over two hundred *carte* prints.

When the water is turned on this thread cylinder is put in motion, the top tube playing on the back; and the tube in the centre of the cylinder, playing on the front of the prints, beats fresh water on them continuously and with considerable force, and they have no chance of getting soaked or pulpy.

One thing to be observed in the use of this machine is that the hole for the escape of the water used shall be equal to run away the supply at once; for, if it do not, the water will gather at the bottom of the tin cylinder in which the hole is placed and catch the prints from their places in their rotation. If this be avoided the prints will remain in their places all through the washing.

It is asserted by the patentee that prints will be better washed by his machine in a quarter of an hour than by several hours' soaking in a syphon tank. However this may be, one thing is certain—that in cases where prints are wanted in a hurry, such as sample copies, &c., a little machine of this kind is invaluable, for this thread cylinder, making over one hundred revolutions a minute, with this spray playing on the prints both back and front—say for the space of fifteen minutes—gives the hypo. every chance of being pretty well beaten out of them.

An American chemist, on analysing some prints washed by this machine, states that he found less hypo. in them after ten minutes' washing than he found in some others which were washed in a syphon tank for an hour and left in the water all night. As regards large prints, they are less likely to be twisted and torn when lying perfectly flat and supported whilst being washed.

We had also before us a new style of picture which has just been introduced to the public by Mr. Abel Lewis, Douglas, Isle of Man—a gentleman well known in the profession for his great enterprise as well as for his beautiful productions in the art-science.

This new picture is called "imperial." The size of the print is $8\frac{1}{2} \times 5\frac{3}{4}$, and it is mounted and finished in the same style as cabinet portraits are. The size of the mount is $10 \times 6\frac{3}{4}$. They look remarkably well, and have every chance of taking. Should this size of picture prove a success it will be of great advantage to those photographers who hold a stock of whole-plate negatives; for they will come in perfectly well for the "imperial," and, by getting up samples, it may lead to a demand for this size from the stock of negatives which they now hold.

Mark Oute.

## HISTORICAL NOTES ON THE PRETSCH ENGRAVING PROCESS.

The subject of the introduction of Herr Paul Pretsch's method of photogalvanography has recently been introduced in one of our continental contemporaries. Mr. Duncan C. Dallas has sent us a long communication on this subject, it having been one with which he was more intimately conversant than any other individual. From this we present the following extracts, as they have a historical bearing on the introduction commercially of one of the earliest methods of photographic engraving:—

"I find myself compelled to decline an honour thrust upon me, not without covert sarcasm. An article on the so-called 'Pretsch process,' by Herr Leipold has been published. In that article Herr Leipold describes me as the only disciple of Pretsch, and writes as if Dallastype and Pretsch's process were identical. I am neither Pretsch's 'disciple,' nor is Dallastype Pretsch's process with another name. *It is physically impossible to apply Dallastype to the Pretsch process.*

"Herr Leipold and a certain Herr Scammoni, of St. Petersburgh, attacked me very severely in the *Journal für Buchdruckerkunst*, in which had appeared an illustrated article on the Dallastype process—an article entirely unsolicited by me, but for which I was asked by the proprietor, Herr Theodore Goebel, to furnish blocks and such particulars as I was disposed to give of the process, and the history of my connection with photographic engraving. The process, of course, I

did not divulge; but I mentioned that I had been the founder and organiser of the Photogalvanographic Company, and had been robbed—I used the word deliberately—of the fruits of my brain and hand labour by Mr. Paul Pretsch. I referred the editor to the 'Pretsch controversy' in THE BRITISH JOURNAL OF PHOTOGRAPHY and the *Photographic News*. Herr Goebel sent me copies of his journal containing long replies by Herren Scammoni, Leipold, and Martin.

"There was a time when I believed in Pretsch. But there came a time when I found that Pretsch was not a 'master' in the arts of photography, electrotyping, and the special grand discovery secured to him by patent. So far, indeed, from Pretsch having taught me, I found I had to teach him.

"I looked up to Pretsch, at first, for guidance, as he had described himself to me as having been *the* manager of the Imperial Printing Office, Vienna, and he had impressed me with the notion that he had had a hand in every fine production and new process of that famous establishment. According to him Councillor Auer—whom he hated and traduced—was *merely* the director, but he (Pretsch) was the moving spirit of the establishment. Ungrateful Viennese! Neglectful Scammoni, Leipold, &c., why did ye not restore him when he returned among you to the proud position of manager of your peerless Staatsdruckerei? How comes it, also, that that great establishment, possessed of such eminent resources with the inventor at its elbow, has never developed the wondrous process, and that Herr Leipold is obliged to admit that, after twenty years, the process is still in its infancy? Does Herr Leipold know that the bantling swallowed nearly £30,000 (thirty thousand pounds) here, and that it received Royal countenance and the aid of some of the most practical men in the country? Surely the great 'master' ought to have carried back to Vienna, besides the cash he received, something more than sophisticated copperplates and prints, which he declared were from absolutely 'untouched' plates.

"I found, unfortunately, after I had induced capitalists to put down a good sum, and had myself sacrificed a good position and the prospect of being a partner in one of the largest colour-printing establishments in the kingdom—Kronheim and Co.—that Pretsch was only a boaster, talker, and withal, as regards manipulative skill and invention, a man of dull intellect. But he assumed an air of profundity which he did not really possess, but which took wonderfully with those who did not know him as well as I and others did who were in daily intercourse with him. I had been his benefactor and had taken him up when his fortunes were at the lowest ebb, when some of the most practical persons in London—his early friends, as Herr Leipold styles them—so far from rallying round him and forming a company, as Herr Leipold also states, had given him up because it was not found possible to work the process. I took him up when, also, he was on the eve of losing his patent for want of funds to pay the fees for completion. His return to me was that he alienated from me the very men, some of them old business friends and connections, *not one of them previously known to Pretsch*, as Herr Leipold would have people believe, all of them men who had never even heard of Pretsch till I made his name known to them and warmly urged them to aid in carrying out what I then believed was a great discovery due only to Pretsch, worked out, as he assured me, in his own private lodgings and without the least knowledge of Fox Talbot's process, although he had been, as he admitted, a constant reader of the *Journal of the Photographic Society*.

"So far from being a 'disciple' of Pretsch, I taught him how to make the process practical, and reduced it to system after he had been floundering about, working in a loose, wild, inconsequential manner. I found that, as a manipulator, he knew nothing of photography and electrotyping but the crudest elements, which he could not even apply.

"But, stay! I did learn something from Pretsch. I learnt 'how not to do it' in photography, electrotyping, and photogalvanography. But that negative discipleship was of little use to me save as a beacon. I learnt the real arts of photography and electrotyping from quite other sources. And as regards photogalvanography, Pretsch showed me a lot of failures, and an altogether crude process containing a knotty problem. He failed to master it. I succeeded. Had I been left—and I say it without vanity—had I been left alone, and allowed to work out my ideas quietly, the Photogalvanographic Company might have been in existence now, and have done some good to itself and the art of photographic engraving, though it might not have continued to work the process which gave it its name.

"But Pretsch certainly taught me another thing. I was young and ardent, free with my ideas. I found I was being sucked like an orange to be ignominiously thrown aside. Pretsch, by his proceedings, taught me to work quietly and say nothing. I also learnt that a secret process was, in many respects, spite of some disadvantages, more secure than a patented one.

"When I ceased to work practically in the company, about £2,500 had been spent in experiments, also in the purchase of plant, fitting up the premises at Holloway, paying Pretsch various sums, also salaries and wages for some months. Further, out of the £2,500 had been paid the cost of two English and all the foreign patents, all of which were taken out at my instigation, and, of course, aided to trumpet forth Pretsch as a wonderful inventor. I showed my *bonâ fides* and desire to remain in the background by cheerfully allowing the second English patent, viz., for the application to calico printing and other purposes, the whole of which was entirely my idea, and was, in fact, at first the chief *raison d'être* of the company, to be taken out in Pretsch's name, as a different course would have doubled the cost of the foreign patents.

"After the dissolution of the company by the Court of Chancery a new partnership was formed. Here, then, was another opportunity for Pretsch, if he had any real quality in him. But what was the upshot? When I formed the company I secured him, a single man, a salary of £208 per annum, in addition to his equal share. I, a man with a family, took the same salary, which was much less than I had been receiving in my former occupation. Pretsch, in the new partnership, was given increased powers and an increased salary, viz., £6 per week. He generally came two days in the week to the company's works, and when there did nothing but potter about uselessly, or gathering together quantities of expensive proofs, distributed them right and left among the great as his productions. The upshot of all was a dismal failure, beside which, the £2,500 spent by me was almost a fleabite, and I had something to show for the money I had spent. I was indeed avenged.

"It was determined to wind up the company. Everyone was paid twenty shillings in the pound. It took about five months to wind up, during which time Pretsch was allowed £3 per week, and did no work whatever, only coming to the premises when it suited him. The plant was sold off, and realised, I believe, £700. The patents do not appear to have been marketable—a pregnant fact! There were also about four cwts. of copperplates—the comparative successes (thanks to highly-skilled engravers), amid, I might almost say, tons of failure. This copper was sold to Pretsch for £15!

"Pretsch received altogether, as I have been informed from a good source, about £3,000 (three thousand pounds)—not bad for three years of very little work and 'how not to do it.' Herr Leipold, in the *Journal für Buchdruckerkunst*, sought to prove that Pretsch had been ill paid by the company, had been impoverished, and altogether ill used and misunderstood here in London. No doubt Pretsch represented himself as an ill-used man, and, of course, never told his sympathising friends that he had got about £3,000 out of the stupid English, who have so much more consideration for Herr This and Signor That than for plain Mr. Blank, their countryman. If ever any man had a fair chance, and received—I might almost say infatuated—belief in his ability Pretsch had it, and notably from the richest and most influential man among my late partners in the Photogalvanographic Company.

"There are two points in Herr Leipold's article which show that Pretsch was a man of dull parts, and worked blindly. One of the points shows also that Herr Leipold himself has never examined the chemistry of the jumble called the Pretsch 'process.' The first point concerns the moulding of the film with a gutta-percha mixture, which I invented—a mixture so efficient as to copy even the polish of glass. It was also the means by which the plates Pretsch carried to Vienna were produced. No doubt, as Herr Leipold does not mention my name in connection with it, it was represented to him as a Pretschian discovery. Now, although Pretsch frequently saw me make the mixture, and also saw the mode in which I used it with ease and success, he never really succeeded in working with it; and, from what Herr Leipold writes, Pretsch seems to the last to have found the operation of moulding with it difficult. Pretsch must have given very indifferent instructions to his friend Herr Leipold, as it appears the latter has found it necessary, *more germanico*, to 'evolve out of his inner consciousness' a by no means simple mixture."

We are really glad to see Mr. Dallas clear up the matter which has so long puzzled us, viz., the value of iodide of potassium that was added by Pretsch to his gelatine film. On this subject Mr. Dallas says:—

"Pretsch always stated as his reason for using iodide of potassium that it was to increase sensitiveness by forming iodide of silver. This was really the thing which completely opened my eyes to the fact that Pretsch knew nothing of what he was doing. I found—when, owing to numerous failures in the film department (till then specially presided over by Pretsch), I began to study the chemical changes which took place—that no iodide of silver was formed. The whole of the silver had been appropriated by the bichromate of potash, leaving that salt in excess. There was no proof that iodide of potassium decomposed a chromate of silver formed in a gelatine solution. I found, further, that chromate of silver was not sensitive to light, and that the addition of iodide of potassium, far from rendering the film more sensitive, still further diminished the sensitiveness, which was due to the bichromate of potash alone. Herr Leipold, the blind 'disciple,' led by his blind 'master,' tumbles with him into the ditch.

"And after all, what is the so-called 'Pretsch process' now worth? Herr Leipold has, I admit, given the most lucid description of it which has yet appeared—more lucid than the inventor's patent. Yet, as I have said, what is it now worth? It is a clumsy, expensive, and roundabout method of photographic engraving. It is a mass of uncertainties and complexities, even on Herr Leipold's own showing. It is not possible to produce by it uniform results, and it requires expensive skilled labour (Herr Leipold says nothing of what the engraver must do) to make its productions presentable works of art of even moderate calibre.

"It is not pleasant to rake up the ashes of the dead, and I should have been content to let Pretsch rest beneath the monument which his

grateful countrymen proposed to erect over his grave. But I cannot be silent when his injudicious friends, knowing nothing of the real facts, seek to bolster up his name. Stone may lie, and has lied; but the elements in time obliterate the lie. Printed words are nowadays more enduring; therefore it behoves all men to keep falsehood out of history. And as regards what I have written of Pretsch now that he is dead, your own pages bear witness that I wrote as fearlessly when he was living."

# Meetings of Societies.

## LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The usual monthly meeting of this Association was held on Tuesday evening, the 23rd ult., at the Free Library, William Brown-street,—the President, the Rev. J. D. Riley, in the chair.

The minutes of the former meeting were read and passed.

The President, after thanking the members for electing him, alluded to the difficulty he had, not being a master of the theory, practice, or chemistry of photography, in deciding on material for an address. He would venture, however, to make some observations on the difficulties experienced by isolated amateurs, which he (the President) did at some length, and concluded by making several practical suggestions as to the artistic labour to be carried out by the members in the various departments of photographic work during the year upon which the Society had entered.

Some specimens of transparencies, with coated plates instead of the usual ground-glass backs, were exhibited by Mr. Atkins, Mr. Ellerbeck, and the Secretary. Some of the opal-coloured films showed that they were far more preferable for backing than ground glass.

Mr. Atkins said he had used an ounce of a ten-grain collodion with two drachms of ordinary negative varnish, and got a beautiful dense opal film which, however, would not stick to the glass unless with an albumen substratum; but that might not occur with a five-grain collodion.

Mr. Ellerbeck and the Secretary had produced their opal films with a mixture of two drachms of varnish to an ounce of negative collodion, and did not find the film to leave the glass.

Mr. W. Atkins then read a paper on the *Keeping Qualities of the Pellicle Emulsion.* [See page 115.]

A number of tanks for the purpose of showing experiments with the sciopticon were exhibited. One, shown by the Rev. H. J. Palmer, had the merit of being easily taken to pieces and cleaned. It was made with two pieces of glass having an india-rubber edging between, and clamped together with thumb-screw clamps.

Mr. Ellerbeck observed that he had made his tank with a horseshoe-shaped piece of rubber placed between two pieces of glass cemented to the rubber with india-rubber solution. These were easily and cheaply made, and were very suitable. He also made some with rubber cord placed between glass and tightened and held together with screws through a wooden frame. He (Mr. Ellerbeck) then gave an exhibition on the screen of a number of chemical experiments with the aid of the sciopticon, and afterwards showed a number of photographic views contributed by himself, Mr. Palmer, and Mr. T. Clark.

A vote of thanks was given to Mr. Ellerbeck, and the meeting was then adjourned.

# Correspondence.

## SIMPLE GRAPHOSCOPE.

*To the* Editors.

Gentlemen,—The subject of graphoscopes and other optical instruments for viewing enlarged single pictures having been recently revived, it seems a good opportunity to bring before your readers a simple arrangement I made many years ago for my own use.

The optical portion consists of a pair of ordinary square stereoscopic lenses reversed, *i.e.*, with their thin edges outwards and the thick edges towards one another, but having a space of one inch between them. This may require to be varied more or less to suit the various widths of eyes.

When mounted thus, the front faces being level, or rather raised towards the outer edges, the eyes look through the more central, inner portion of the lenses, where there is but little chromatic aberration. With my lenses of seven-inch focus I can very comfortably see pictures 6 × 4 inches. Though *each* eye does not take in quite the whole width, on account of the intervening space between the lenses, the whole picture is viewed by *both* eyes with very slight obstruction, provided the septum, including the edges of the lenses, be blackened to avoid light being reflected into the eyes.

This mode of placing the lenses gets rid of much distortion; there is, of course, some distortion of the hour-glass form. This, which is chiefly seen at the margins of the picture, may be counteracted by putting the picture behind a blackened frame the inner margin of which is of the opposite or barrel-shape. By this ruse the eye is cheated. Though the lines of the picture are not mathematically correct, yet in the majority of subjects there is nothing visibly offensive in the way of distortion.

The pictures should be enclosed in a box, properly illuminated, all light being carefully shut out from the eyes. Much of the illusion is lost in the open graphoscope.

I do not myself like what Professor Piazzi Smyth calls the "mono-stereoscope." My eyes are not comfortable with one active and the other passive, they have been so much accustomed to work simultaneously. Admitting that there is more relief in a monocular picture when viewed with one eye only, the benefit in my own case is counterbalanced by the discomfort of so viewing it.

I regret to see the term "stereoscope," which has been applied so distinctively to *binocular* pictures, made use of in connection with *monocular*. I think the relief seen in single pictures should not be confused, in fact or in name, with that specific representation of solidity resulting from the combination of right and left view pictures, properly designated "stereoscopic." There is already too much confusion in this matter, many people insisting that they can see stereoscopic effects perfectly with one eye!

The instrument above described may be used by reflected or transmitted light—that is, for opaque or transparent pictures—by having a ground glass behind them.

I place my paper pictures, for viewing, in a sort of portfolio consisting of a sheet of glass with a cardboard or metal frame hinged to it. The picture is inserted between the glass and the frame, and the whole dropped into a groove on each side of the box.

Your recent article on *Plain Paper Printing* has interested me much. No doubt it is *the* process for transparencies. I will send you shortly some samples of what I have done in that way.—I am, yours, &c.,

*Cheltenham, March* 2, 1875. G. S. Penny.

## COLLODION PROCESS.—ERRATA.

*To the* Editors.

Gentlemen,—Two or three little words have inadvertently slipped into the wrong place in setting up the type of my last communication. The observation I intended to attribute to the inspired writer was that "there is a time for everything under the sun." He proceeds to show his meaning by adding, "a time to be born and a time to die." These are matters of all-absorbing importance; but the same truth, no doubt, applies to others of comparatively less consequence. Hence we may say without any irreverence that there was a time for the collodion process to be discovered, and when that time arrived Archer discovered it; so, also, of every subsequent improvement or simplification of the same.

The late Dr. Miller, of King's College, often made allusions of this kind in his lectures; and I have heard him on more than one occasion express his confident belief that if we really need anything it is generally in existence somewhere, and that a kind Providence will give it to us in due time. Such were the thoughts passing through my mind when I wrote the paragraph referred to.—I am, yours, &c.,

*Shotton Vicarage, Castle Eden,* T. Frederick Hardwich.
*February* 27, 1875.

## DR. NICOL ON PRELIMINARY EXPOSURE.

*To the* Editors.

Gentlemen,—Dr. Nicol should try to be consistent, and not condemn tomorrow what he is pleased to praise today.

On the 23rd October last we had the advantage of his opinion on the subject of pre-lighting. That opinion, given in brief, is this:—That pre-lighting "*in no case*" adds "the slightest visible trace" of detail to the negative which has received it. A slight veil of fog, he says, will undoubtedly improve the printing qualities of a plate which, in the camera, has been under-timed, "and this," he adds (alluding to the fogging) "is just what supplementary exposures do." He concludes the article in question with the expression of a hope that his experimental friends will set themselves to work upon "*the as yet unsolved problem* of how materially to shorten the exposure," and he promises "fame and, perhaps, fortune too" to him "who first succeeds."

In your issue of this week your contributor alludes, in terms of much disparagement, to some "process-monger" who, prior to the publication of his opinion as given above, had sold a method by which, it was alleged, the exposure in the camera might be reduced. Of course, if the allegation be untrue, it would be difficult to justify the sale; but if additional detail *can* be got by any form or mode of pre-exposure, the fact, at least, is new to Dr. Nicol, and must be so to several thousand less constant readers of photographic literature than he. If, then, the thing be new, let Dr. Nicol show the dishonour in its sale.

Where is the "fame" and where the "fortune" that await the solver of a photographic problem, when the *literati* of the art cry out—"Beware of him whom we, four months ago, invited you to honour?"—I am, yours, &c., Diogenes.

*February* 26, 1875.

## EXCHANGE COLUMN.

I will exchange a first-class quarter-plate lens, by Jamin, for a half-plate camera.—Address, H. Morris, 8, Lordship Terrace, Battersea Rise, Surrey.

Wanted to exchange a mahogany stereoscopic camera for plates $6\frac{3}{4} \times 3\frac{1}{4}$, three double backs in portable leather case, for a $4\frac{1}{4} \times 3\frac{1}{4}$ pocket camera.—Address, J. W. Grimshaw, 7, Esplanade West, Sunderland.

Wanted, a first-class whole-plate travelling camera and lens, doublet, triplet, or rapid rectilinear. Will give in exchange a treadle sewing-machine, with lock-up table, or first-class Whitworth rifle, in oak case.—Address, J. W. King, 15, St. John's-square, London, E.C.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

R. Clennett.—Announcement in our next.

R. Pringle.—Let the stops be inserted between 7 and 8; that will prove the most advantageous position.

Subscriber (Leeds).—Emulsion of the kind required is commercially obtainable and has often been advertised.

J. T.—We regret that, until the publication of the patent, we have no means of ascertaining the nature of the process.

Rev. P. B.—Dissolve the nitrate of silver in one half of the gelatine solution and the chloride in the other, and then mix.

W. Vick.—If you furnish us with the names of the subject and artist we shall, perhaps, be enabled to give the information required.

P. Olish.—Can any reader favour this correspondent with information concerning the method of enamelling by means of soap powder, and the best way of making or procuring this powder?

Juvenis.—The propriety of what you advise had been carefully considered long before we received your letter; but, for reasons which need not here be entered into, we arrived at a conclusion different from that you have suggested.

J. Hart.—The object glass of the ship telescope will certainly answer for taking landscape negatives, but will not be equal to a properly-constructed landscape lens. Owing to over-correction for colour it will scarcely work to visual focus.

J. C. M.—We are informed that the auctioneer you mention has now discontinued receiving chemicals and solutions in bottles for sale; hence it will be better for you to employ a local auctioneer to effect a sale of the goods of your deceased relative.

J. H. S.—Your case is not at all uncommon. Employers can scarcely be expected to retain assistants when they have no work for them to do. In making your next engagement you should have a stipulation as to the period over which it is to extend.

J. W. King.—1. We are unacquainted with the "subject" of the picture enclosed.—2. After being subjected to such treatment as that described the plate may be examined in bright sunlight, but it must be fixed previous to being intensified.—3. We have not tried the experiment indicated by you. Why not try it yourself?

T. B.—The space at your disposal is quite sufficient for the erection of a good studio. Let it be of the lean-to form, the slope of the roof being towards the open space on the north-west side. If the studio be required for professional purposes let the whole space be roofed in, as the proportions are good. If for amateur purposes it may be much less, keeping, however, to about the same proportions.

P. T.—1. The Zentmayer lens is not in general use in this country; indeed we know of no one in London or the neighbourhood who uses it. Your best chance of obtaining one will be through Mr. J. J. Atkinson, Manchester-street, Liverpool.—2. The globe lens differs from that introduced by Zentmayer, inasmuch as the component parts of the former are achromatised and are of similar dimensions and focus, whereas the latter is an unsymmetrical compound composed of single lenses.

W. D. S.—From your description the carbon tissue seems either to have been over-exposed, to have become partially insoluble owing to exposure to light or to decomposition of some kind, or else you have neglected to put a "safe edge" of black varnish or opaque paper round the negative. Until you acquire experience allow as brief a period of time as possible to intervene between the sensitising of the tissue and its exposure and development. Ordinary gaslight will not affect the tissue.

J. T. A. writes—"Will you kindly inform me in your next issue of some black opaque mixture, or other colour, to stop out the background of machinery negatives that will not *chip* off through exposure to the sun? I have repeatedly tried Bates's black varnish; but it is not easily worked where so much care is required, as is the case in stopping round machinery, wheels, framework, &c., where the slightest jagged line shows bad. Some years ago a Manchester friend, now dead, mixed me some black water colour which withstood heat, whilst ordinary water colour and india-ink chipped."——We invite an expression of the experience of our readers on this subject.

J. G. W.—When an image is sharp on the ground glass and is not sharp in the negative, it indicates either that the sensitive plate has not been placed exactly in the same plane as the focussing-screen, or that the visual and actinic foci of the lens do not coincide. In testing for these defects focus the image very carefully on the usual ground glass, and then insert a plate of finely-ground glass in the carrier of the dark slide, which insert in the camera in place of the focussing-screen. Examine by means of a strong magnifying glass whether the image is equally sharp when seen under both circumstances, and let the result of the investigation determine the course to be subsequently adopted.

A. N.—If the mountant now employed be similar to that used with the plain cards, and if the prints are produced under similar circumstances, the enamel is at fault. We cannot say of what material the enamel is composed, not having leisure at present to make an analysis.

T. Frederick Lane says:—"1. Will you kindly inform me through the Journal the best means of photographing an oil painting? I have tried to copy one in my possession, and I find that the lines and streaks of the paint appear very prominently in the negative. Is there any way of getting a *smooth* copy? I have seen some photographic prints which are said to have been taken from oil paintings, and they look very well.—2. Can you inform me how to eradicate the rust from the steel roller and plate of a rolling-press without leaving scratches or impairing the surface of the metal?"——We reply:—1. The great secret in obtaining a successful negative from an oil painting is to have it illuminated by diffused light. Some continental artists who are very successful in this branch of photographic work lay the painting flat on the ground and point the camera downward.—2. The roller must be re-ground and polished.

*** Several articles are unavoidably left over, including "Editorial Table," containing notices of Woodbury's *Treasure Spots of the World*, Werge's *Illustrations of the Senses*, *Pantascopic Views in the Lake Districts*, Macfie's *Patent Question in* 1875, and other matters.

Transit of Venus.—Sir G. B. Airey, the Astronomer Royal, has received the following telegraphic intelligence:—"Telegram from Kerguelen:—Transit of Venus. Expedition through Stone, Cape Town, *via* Madeira. 'Corbet, Coke, and Goodridge observed ingress; Perry, good egress; all something cloudy. Generally, English photography poor. The Americans and Germans lost internal contact. The Americans have some photographs.'"

Another Important Discovery!—A correspondent who is fond of a joke lately sent us the following as "his last":—"I have not yet heard of any fortunes being realised by the use of the grand and original process for applying pastel or crayon to the backgrounds of photographs—which was *not* patented; and, inasmuch as the value of my inventions do not seem to be appreciated, I hesitate to venture once more on another brilliant invention. However, looking at the leading topics that have engrossed the attention of the photographic fraternity during the past year, the subject of shortening the camera exposure seems to offer a field for "another important discovery," and here it is:—*Fact No.* 1.—Mr. X—— has discovered a method by which the exposure in the camera is reduced *one-half*, and those who have used the method say it is good. Dr. Z—— has invented a solution which, added to the ordinary iron developer, also reduces the exposure *one-half*, and the tongue of good report has been heard in its favour. Now, then! Attention! Here is the brilliant idea! Use X——'s process and Z——'s developer, the first of which takes off one-half the exposure, and the other annihilates the remaining moiety, and, don't you see? we can do without any exposure at all! It is proper to mention that I have not tried this, but it *looks* all right."

## LONDON GAZETTE, *Wednesday, March* 3, 1875.

Partnership Dissolved.

Frank Scott and Co., Birmingham and Wolverhampton, photographers.

## METEOROLOGICAL REPORT,

*For two Weeks ending March* 3, 1875.

Observations taken at 406, Strand, by J. H. Steward, Optician.

These Observations are Taken at 8.30 a.m.

| Feb. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 18 | 30·20 | NE | 35 | 37 | 41 | 36 | Dull |
| 19 | 30·18 | NE | — | 33 | 36 | 32 | Dull |
| 20 | 30·02 | NE | — | 30 | 35 | 30 | Snow |
| 22 | 30·17 | E | — | 31 | 40 | 30 | Dull |
| 23 | 29·88 | E | — | 31 | 37 | 30 | Cloudy |
| 24 | 29·36 | NE | — | 30 | — | 27 | Dull |
| 25 | 29·43 | W | 33 | 34 | 43 | 29 | Snow |
| 26 | 29·55 | E | 37 | 38 | 57 | 34 | Dull |
| 27 | 29·61 | E | 33 | 35 | 37 | 34 | Dull |
| March. | | | | | | | |
| 1 | 29·76 | NE | — | 32 | 35 | 31 | Dull |
| 2 | 29·79 | NE | — | 32 | 36 | 31 | Dull |
| 3 | 29·83 | E | 33 | 35 | 36 | 31 | Dnll |

## CONTENTS.

# THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 775. Vol. XXII.—MARCH 12, 1875.


## APPLIANCES FOR OUT-DOOR PHOTOGRAPHY.

Our columns this week contain two contributions to the important art of making things comfortable to the photographer who operates away from home. One of these is directed to the simplification, mechanically considered, of the wet process, and the other to that of dry-plate photography. In the former it is sought to obviate the necessity for taking a tent to the country when one desires to do a little out-door work with wet collodion; while in the latter a laudable attempt is made to do away with dark slides.

At the last meeting of the Photographic Society of France an apparatus was exhibited having for its object the sensitising, exposure, and development of a collodionised plate without the aid of a tent or dark box. The apparatus is a kind of flat, covered well-bath, the bottom of which is formed of ground glass, and thus acts as a focussing-screen when the dish is placed *in situ* on the camera. It may not be generally known to our foreign friends that this idea was carried into practical operation in this country several years ago, but has not found favour with the practical photographer—for several reasons. One may be given, and, as it lies at the very foundation, it cannot possibly be got over, viz., the necessity that exists for exciting and developing the plate in one vessel.

No photographer who recognises the necessity for retaining his silver bath in proper condition would for a moment consent to pour it backwards and forwards into and out of a dish which is made to do the double duty of alternating between a developing-sink and a bath-holder. Cameras have been constructed, and are still to be met with in commerce, in which the same principle of action is involved. The body of the camera forms a water-tight vessel holding a quantity of silver solution, which is made to flow over the face of the coated plate while it is in its place at the back of the camera. This liquid is withdrawn, the plate exposed, and a quantity of developing solution introduced by means of a pipette, which, by tilting back the camera, flows over the surface of the plate and developes the image. Then commences the work of washing and scrubbing out the interior of the camera to render it sufficiently clean to be a receptacle for the nitrate bath again; and this has to be done after each plate is developed.

The objection to this system was not long in being recognised, and steps were adopted to have the defect remedied. Hence arose what may be termed the natural means of obviating the necessity for having one vessel in common for iron and silver; separate baths were introduced, and some of these appear to have answered quite as well as could have been expected. Among these we may mention an appliance invented in 1866, by Mr. Nelson Wright, of America, which was fully described in our volume for that year. In that apparatus separate vessels were used for each different kind of solution. Those who may be interested in Mr. Wright's apparatus are referred to page 439 of the volume mentioned, where will be found working directions for making it. A further modification was introduced some years later by Mr. B. J. Edwards, under the designation of the "graphogenic apparatus," which, like Mr. Wright's apparatus, has a separate bath for the bath and developer.

But none of these appliances, though ingenious, have found favour with photographers, who prefer one or other of the numerous and really convenient and portable tents now so readily obtainable, and in which the various manipulations can be carried on with a degree of certainty and comfort quite unknown in connection with the apparatus referred to, in working with which there is rather more guesswork required than one likes. For the obvious reason, then, that *better* forms than that described in Professor Stebbing's letter have been introduced and have not "taken," we have no hesitation in predicting, which we do with regret, that this the latest outcome of French mechanical ingenuity will not be received with much favour in this country. Efficiency in apparatus of this kind can only be secured at the expense of a multiplicity of appliances and accessories, and even then the efficiency is of a lower type than can be obtained by the use of the portable tents so well known and so much used in this country.

We now turn to the other department, in which an attempt at simplification has been made in regard to dry plates, and here we are in a position to report more favourably. Mr. Aird's camera, described in another page, differs in certain respects from any other previously introduced. In it the plate-box fits below the camera proper, and by means of a plunger any particular plate may be raised up through a slit in the bottom and placed where it is acted upon by the radiation from the lens. It bears a general resemblance to Cook's patent camera, which was described, with illustrations, in this Journal for October 8, 1869, and also in our Almanac for 1874; but it differs from it in several features, which will be perceived on a comparison of the two.

Shortly after the introduction of Cook's camera we had an opportunity of putting it to the test of actual work in the field, and reported at the time its satisfactory performance. From some cause, however, it does not seem to have come into very general use, the older method of the separate camera and double slides having kept its ground.

The system of double dark slides is, no doubt, very efficient; but if they are not well made they soon get out of order, and, when properly constructed, are very costly. In any case they are rather bulky—a serious objection to the *dilettante* tourist, who wants, with the least possible amount of trouble and the greatest possible convenience, to cull the gems, either of landscape or architecture, which cross his path as he moves about from place to place.

A camera constructed on the principle described and figured by Mr. Aird will, we think, not cost much more than half what would be charged by one of our best makers for an ordinary camera and six double slides; and if what is claimed for it by the inventor—and what seems to be borne out by an examination of the diagram accompanying his description—should, on more extended trial, turn out to be true, we believe that, in many cases at least, it will supersede very advantageously the older form.

An exceedingly simple and convenient form of camera of this kind was introduced many years ago by Mr. J. J. Atkinson, of Liverpool, which was very useful for dry plates of large dimensions, the one which we saw being intended for plates 15 × 12 inches. It was modified from the original construction, and consisted of a plate-box with an aperture which could be brought directly opposite to any one of the twelve plates contained in the box, and, at the same time,

opposite to an aperture in the side of the camera, through which the plate was transferred readily from the box to the camera. This was somewhat simpler than the form now introduced by Mr. Aird, and we never heard of any special objection made in the course of working with it. As respects cheapness of construction nothing certainly could surpass this instrument.

But while for taking a few—that is, about six or eight—plates on a tour nothing is found to surpass in convenience the usual double dark slide, when larger numbers are required it becomes a question whether it might not be well to resume acquaintance with the very ingenious but partially-discarded "changing box and dark slide." We can speak from experience that, when this piece of apparatus is well made, it is quite easy to transfer eighteen plates in rotation to and from the dark slide in bright sunshine without one of the plates suffering from accidental exposure. Mr. Aird's camera partakes somewhat of this changing-box idea; but the box of plates has an apartment below the camera, and the dark slide is altogether dispensed with. From the description given we imagine that it will answer admirably.

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The London Photographic Society has little cause to be proud of the new code of laws it unwisely adopted, by an accidental majority, during the constitutional agitation of last year. A more imperfect and disjointed set of rules was probably never agglomerated for any society—learned or unlearned, scientific or otherwise. To make the matter worse, on the first occasion when there was any need of repairing their defects, it was discovered that the lawmakers were so convinced of their own infallibility that they introduced a feature in the constitution making changes practically impossible, a ludicrous instance of which was furnished at the last meeting of the Society. The constitution provides that no member shall have a right to vote until he has paid his subscription for the ensuing year. It was proposed to amend this clause by substituting the "*past year*" for the "*ensuing*" year; but the making of this alteration, simple though it seems, was found to be beyond the legal power of the meeting, although it had been called for the special purpose, this modification requiring to run the gauntlet of two successive special meetings and a ballot of the whole Society. This model constitution reminds us of the highland drover who, when giving testimony before an Edinburgh judge, so mixed up the sexes in speaking of a certain child—according to the well-known peculiar habit prevailing among a portion of the Scotch highlanders—that the judge in bewilderment besought the witness to say plainly whether the child was a male or a female, when the witness set all doubt at rest, as he imagined, by informing the court that "him is a she." This is typical of the laws in question. Mr. Glaisher, at the recent meeting of the Society, found himself in a position something similar to that of the judge referred to in not being able to discover whether a certain rule applied to a "him" or a "she." As the constitution stands at present it can neither be conveniently amended nor intelligibly construed; and, to complete the climax of absurdity, there is no means of filling vacancies on the Council should they occur, so that if the President and Council should again take it into their heads to retire *en masse*, no means exist for carrying on the organisation of the Society. No wonder that much sympathetic applause greeted Mr. Glaisher when he remarked that after looking over the laws very carefully he found them to be so contradictory as to urgently demand entire reconstruction, which, he hoped, would be speedily done. Members of the Society wil readily recall to mind the elaborate and carefully-considered code of laws presented for their consideration by the committee of the reform party last season, and which was rejected by the accidental preponderance at a particular meeting of those members who previously had been in the minority, and to whose intemperate party spirit the Society is indebted for its present dilemma. The Society could not do a wiser thing than to reconsider the rejected laws with a view to their adoption, with such amendments as may be considered expedient.

## CHLORIODO-BROMIDE EMULSION.

In my communication of last week I mentioned that a combination of silver iodide, chloride, and bromide in an emulsion gave a higher degree of sensitiveness than anything which had been yet attained. My results since then have more than justified this opinion. It is certain that all other forms of collodion emulsion are left far behind, and I am inclined to believe that even the most sensitive gelatine emulsions that have been made are surpassed by it.

It is not very easy to make exact comparisons in such matters, but the following are the grounds for the conclusion:—In the opinion of the Editor of The British Journal Photographic Almanac Mr. Kennett's emulsion pellicle gives plates exceeding in sensitiveness any collodion emulsion plates known, and he observes that, thanks to this method, we have dry plates at least as sensitive as wet. A correspondent, at page 549 of last year's Journal, places this sensitiveness much higher than that of wet plates. And Mr. Kennett, in speaking of transparencies exhibited by him, remarks that part of them were made by gaslight, with an exposure of from five to ten seconds at the gas flame.

Although, of course, the intensities of gas flames may differ very much, yet this gives a roughly-approximate mode of measurement; and I find with my new plates I get a well-exposed transparency with a *single second's* exposure before the gas flame.

I take Mr. Kennett's pellicle for comparison as a commercial article, accessible to everyone, and spoken of by independent experimentalists as representing the highest degree of sensitiveness yet attained by any process, wet or dry. And as I have myself succeeded with a much shorter exposure than that used by Mr. Kennett, I think my emulsion may not improbably be more sensitive. Comparison with any of the older forms of emulsions are out of the question.

In saying that I can print a transparency by gaslight in a second, I mean a fair second without exaggeration. Neither do I mean that this is a casual or occasional result; it succeeds, on the contrary, with perfect facility. The image comes up at once; no forcing is required. It rapidly advances to full density, and when this is reached the action is still steadily advancing, so that, if desired, a double density could be got by the alkaline developer exclusively and without the slightest need of silver redevelopment. Of course with a dense negative a somewhat longer exposure would be necessary; but with an easy-printing negative the one-second exposure is ample, and no signs of under-exposure are visible.

There is the further advantage that a great latitude of exposure appears to be allowable. The same plates, with the same exposure and the same or similar negative, the same gas flame, were tried with the following exposures, viz., one second, four seconds, thirty seconds. In each case a good result was obtained; there is little, if anything, to choose between the three.

This latitude makes the plate suitable not only for very rapid work, but also for general utility in view making. Of course, however, it will be necessary to be on one's guard against excessive over-exposure.

What I have just said refers to plates made with excess of silver nitrate. The method seems also likely to be very useful for plates made with excess of alkaline bromide. These are, of course, less sensitive; they come, however, very nearly up to the best chloro-bromide plates hitherto prepared. This leads me to remark that the sensitiveness of the chloro-bromide plate seems to me to have been undervalued. Plates which I have recently made with the formula given at page 220 of the Journal for 1874, substituting in the collodion two grains of cupric chloride to the ounce of collodion instead of the cobalt chloride, have given me fully-exposed transparencies with a *four-seconds'* exposure to a gas flame. The formulæ for the two forms of the chloriodo-bromide process which I have adopted are given below.

1.—Emulsion with Excess of Silver Nitrate.

To the ounce of plain collodion, which should contain three parts of alcohol and five of ether, both of high grade, and eight grains of pyroxyline to the ounce, add—

| | |
|---|---|
| Dried* cadmium bromide | 8 grains. |
| Ammonium bromide | 2½ ,, |
| Ammonium iodide | 2 ,, |

Two drops of *aqua regia* to the ounce are to be added. The mixture is to be sensitised with twenty-four or twenty-five grains to the ounce of silver nitrate, and, after sensitising, two grains to the ounce of cupric chloride are to be added. This should be added *after* the sensitising, because, if added before, the collodion becomes dark and discoloured in consequence of the formation of cupric iodide. As cupric chloride is very soluble even in cold alcohol it

* See letter, page 129, in the present number.

saves trouble to make a solution of sixteen grains to the ounce, and add a drachm to each ounce of emulsion after sensitising.

The soluble salts and the *aqua regia* are sufficient to decompose something over *twenty grains* of silver nitrate, consequently there remains an excess of four or five grains. I may remark in passing that this corresponds remarkably near to the excess—three to five grains—which I used and recommended nearly five years ago, in the summer and autumn of 1870, and published at the same periods. The *amount* of silver nitrate is larger, because the amount of salts in the collodion is correspondingly larger. My collodion, which is nearly a year old, bears this large quantity of silver haloids perfectly. Perhaps with newer collodions the emulsion may be too thick, in which case it needs only to be thinned. Plain collodion is better for thinning in such cases; ether is only best when the residues of emulsion, after pouring off and on, become too thick by reason of evaporation.

The preservative which I recommend consists of—

| | |
|---|---|
| Thick solution of gum arabic with a little sugar, | 1 ounce, |
| Prepared albumen* ........................................ | ½ ,, |
| Sixty-grain alcoholic solution of gallic acid...... | ½ ,, |

to be added in the above order to six ounces of water. This is for $6\frac{1}{2} \times 8\frac{1}{2}$ plates.

Tannin, in the proportion of half-an-ounce of sixty-grain solution, can be added (last of all), if preferred.

I have omitted to mention that I add a drop or two of tincture of iodine to the collodion, till it has the colour of pale sherry. Also, I use the brown ammonium iodide. Too much free iodine will, of course, diminish the sensitiveness; it should, therefore, be added with caution. The plate should be plunged into the bath of preservative without any intermediate washing.

The development is the ordinary alkaline, such as I have recommended elsewhere, except that I use a little more bromide. Put half-a-drachm of sixty-grain alcoholic solution of pyrogallic acid into four ounces of water (for a $6\frac{1}{2} \times 8\frac{1}{2}$ plate), put in the exposed plate, and tilt the pan so as to wash the liquid evenly over the plate. Add together half-a-drachm each of eighty-grain ammonium carbonate and thirty-grain potassium bromide. When the image appears repeat this last dose of both carbonate and bromide, and presently add another drachm of carbonate solution.

The development is easy and regular. The plate rapidly gains in intensity, and this steadily continues, so that any amount desired may be obtained. I have not in any single case seen a bad development.

I have recently adopted the plan of adding to my developer some of the same gum and sugar solution which I use in the preservative. Neither the strength nor quantity are very important, but I think the development advances more regularly and certainly in this way. A thick solution of gum, containing about a fourth as much sugar as gum, may be added in the proportion of about half-an-ounce to four ounces of bath.

For all dry plates I prefer a pan to developing on the plate. I am accustomed to have my negatives perfect up to the line of the edging of india-rubber, and if the development be made on the plate the edges are more apt to suffer from irregular action. The mode of working on the plate is good for wet development, or for dry work when the edges are not wanted.

I do not care in any emulsion work to see the image come with the pyrogallic acid alone. Some hold that a plate which does not so act is under-exposed; but I rather think that a plate in which the image comes up without alkali is over-exposed, and the subsequent treatment will need to be very careful.

I omitted to say that I use, as heretofore, an edging of india-rubber dissolved in benzole, and not a substratum. These plates seem less disposed to collect water and fixing solution under the film than chloro-bromide plates; indeed it is very remarkable how greatly the addition of a small proportion of iodide alters the plate. The chloro-bromide plates, prepared in the manner already described, give negatives that greatly resemble iron-developed plates made in the wet way. The appearance by reflected light is light greyish, and the image, when held up to the light, is brown. The addition of two grains of iodide completely changes this. Besides trebling the sensitiveness it utterly changes the appearance of the plates, which are black viewed in any way. Held up to the light the image is a rich deep black, with endless varieties of half-tone, giving the most beautiful effects. As transparencies they are perfect, and no toning could improve them.

The image stands the fixing bath much better than the chloro-bromide image, and, without any redevelopment, is scarcely reduced by it. Nevertheless, I prefer to use a very weak fixing bath because it acts quickly enough. With two ounces of hyposulphite to the gallon the plate is cleared in two minutes.

2.—Chloriodo-Bromide Emulsion with Excess of Alkaline Bromide.

The formula for the emulsion is the same precisely as the foregoing, except that the *aqua regia* is omitted and the proportion of silver nitrate reduced. In this case the collodion requires for exact saturation eighteen and two-third grains of silver nitrate. Seventeen or eighteen grains may, therefore, be added. Of course, if we attempt to come so near as eighteen grains, it will be necessary to be very exact in all measurements and weighings. If seventeen grains be used so much exactness will not be required, but a slightly inferior degree of sensitiveness may be expected. As in the former case, the cupric chloride should be added last. With this emulsion the addition of the cupric chloride after the silver nitrate has this farther advantage—that the emulsion is thus left for a time in presence of excess of soluble silver salt, which is favourable for sensitiveness.

Development to be effected with a little less bromide. Put four ounces of water in a pan, add half-a-drachm of sixty-grain alcoholic pyrogallic solution, put in the plate, then mix in a minim measure half-a-drachm of fifteen-grain solution of potassium bromide with an equal quantity of eighty-grain ammonium carbonate solution. As soon as anything appears repeat the dose of carbonate and bromide. Afterwards add from half-a-drachm to a drachm of carbonate solution without bromide. Fix as before.

3.—Application to the Washed Emulsion Process.

I have also examined the application of the chloriodo-bromide emulsion to Mr. Bolton's ingenious washed-emulsion process. Nitro-glucose was added to the collodion, and it was made up with an excess of alkaline bromide, dried, washed, and redissolved.

The plates gave clear images, but were much less sensitive than those prepared in the modes just described. With an exposure of six seconds to the same gas flame, and with same negative as before, a distinct image was got, which, however, would not come up to density, nor would it intensify satisfactorily with silver. With twenty seconds' exposure a much better image was got. It would not, however, come up to density, but it intensified with silver, though slowly. I judged that an exposure of about a minute would have been necessary to get an image which would have taken a proper density by the aid of the alkaline developer alone.

When the image obtained as just described with twenty seconds' exposure and redevelopment with silver was compared with that obtained on chloriodo-bromide plates prepared with excess of silver nitrate by the exposure of one second and development with alkaline pyrogallic acid alone, the latter were found to be superior in vigour and in variety and richness of half-tone. I conclude, therefore, that, though the addition of an iodide may doubtless increase the sensitiveness of the washed emulsion plates, yet it does not enable them to compete with chloriodo-bromide plates made in the ordinary way.

I am now preparing to examine the application of the new method to the gelatine emulsion process, and will send the results later.

M. Carey Lea.

* In the directions given last week for preparing albumen, I think I made the quantity of acetic acid too small. Using our "No. 8," which I believe corresponds to the English "Beaufoy's," I add twenty-five minims to each fluid ounce of white of egg, and an equal bulk of water to that of egg. The mixture is then to be shaken in a stout bottle with bits of glass, and to be filtered through sponge. It greatly facilitates the filtration to let the fibrinous matter settle before filtering, and pour off the nearly clear liquid into the filter. If the liquid stop passing pour it quietly off, and wash the sponge from the fibrinous matter which has choked it. Albumen prepared in this way keeps almost indefinitely. That which was used in preparing the plates used for the one-second exposure was nearly a year old—a proof that it does not deteriorate.

## A CAMERA FOR DRY PLATES.

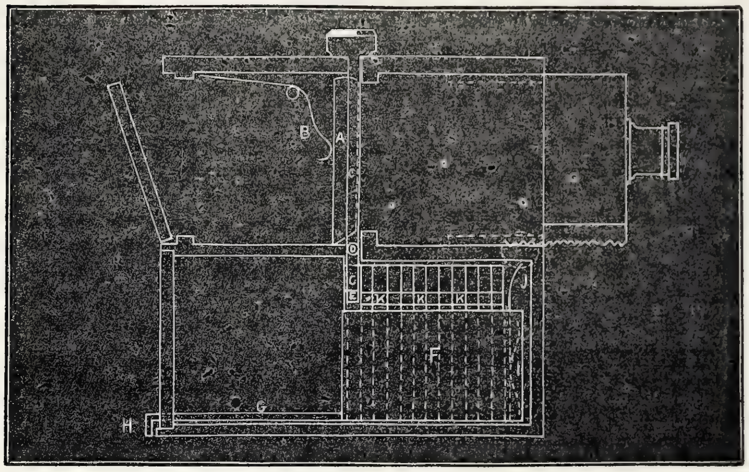
[A communication to the Edinburgh Photographic Society.]

While the resources of landscape photographers have received valuable additions in those various dry processes which have been perfected during the past few years, to those especially who only practice our fascinating art in their hours of leisure and relaxation the ease and certainty with which dry plates can now be prepared render them a boon which cannot fail to be felt and appreciated; but it is a curious fact that the more we advance in improvement the more we feel how much may yet be done.

To workers of the wet process the usual arrangement of camera and dark slide appears to be all that can be desired, but when we take an excursion into the country with two or three dozens of dry plates the number of slides necessary for their accommodation forms a fruitful cause of inconvenience and vexation. The apparatus best suited for the use of the tourist must be compact and complete in itself, strong to withstand hard knocks, and not liable to get out of order. The camera which I have brought before you tonight has, I think, at least those three good qualities. It measures $8 \times 8\frac{1}{2}$

inches and 5¾ broad; but as it was intended for experimental purposes I only made it to contain quarter plates 3¼ × 4¼. It holds one dozen plates, but could be made to accommodate fourteen or fifteen.

It is, as you will see from this drawing, divided into two compartments, the upper one being furnished with a lid on one end, and having a sliding front with rack adjustment for carrying the lens.




This part might be made with a bellows body or any other arrangement for lengthening the camera usually adopted by camera-makers. In the centre of this upper compartment is the focussing-screen A, held forward in its place by the two springs B B. The slide for raising the plates is an open frame, being simply two slips of brass C, one passing down each side of the focussing-screen and joined by a round cross-bar D at the bottom, a short distance from the end. The end of each strip of brass is furnished with a small projection E, the use of which we shall presently see.

In the under compartment, which is designed to hold the prepared plates, is a box F, one-half the length of the compartment, capable of slipping from one end to the other, and moved by the slip of brass G, which projects to the outside at H. In this box is placed one dozen slender frames for holding the prepared plates, and which are all pressed together by a spring I at the end of the box, where there is also a shifting end with its top edge sloped off, as at J. Along the sides of these frames there is run a groove K, into which the projections on the ends of the slide fit loosely.

The manner in which the apparatus works is this:—After having selected and focussed your view the door at the end is shut so as to exclude the light, and on raising the slide it brings with it that frame, with its prepared plate, which is at one end of the box; the round bar on the slide acting on the under side of the focussing-screen, which is sloped off for that purpose, pushes it back, and the plate occupies its place instead. After exposure the brass slip is pulled out, when, on pressing the slide down again, the frame, acting on the sloped edge of the shifting end, pushes it back and is received into the other end of the box from which it was taken. On pushing in the slip again the frames with the plates all go through between the projections on the end of the slide, except the first one in the box, which will be brought up the next time the slide is raised, and so on until the dozen are all exposed, all that is necessary being to keep a memorandum of the number of plates which have been exposed.

Again: by having this brass slip divided into the same number of spaces as the frames occupy in the box, you can select any one you please from among the plates instead of taking them by rotation. For example: if 1, 2, 3 are one kind of plate, and 4, 5, 6 another kind; if you wish to expose 4, by pulling the slip out to the fourth division and then raising the slide you bring up that plate, but then it must be borne in mind for future operations that 5 and 6 will have slipped forward and will now occupy the place of 4 and 5.

I may state that the space behind the focussing-screen is very useful for packing away the lens or other small articles in. I have no doubt that this apparatus may be much improved upon, but I must say it has thoroughly fulfilled all my expectations. D. Aird.

## ON PRINTING GLASS TRANSPARENCIES UPON ORGANIFIED WET COLLODION FILMS.

Most readers must have observed, in the course of their experience with various photographic processes, the fact that when certain kinds of organic matter are mixed with the metallic silver or other substance which forms the shadows of the picture a greater degree of vigour is produced. This is true whether the proof be upon paper or upon glass, and also whether it be intended to be looked *at* or to be looked *through*. Take, for instance, a silver print upon albumenised paper, and compare it with one upon blotting-paper, done by precisely the same process of exciting, toning, and fixing; what an immense difference will be perceived in the vigour of the two! It is, in fact, just the difference between a dry pigment in powder and one which has been mixed with white of egg.

The same thing is equally true of developed prints upon paper, and also of glass transparencies. Take a developed print upon a piece of plain paper, simply salted and excited upon a plain bath of aceto-nitrate of silver, and compare it with a developed print upon a piece of the same plain paper simply salted, but excited upon a nitrate bath containing some of the mucilage of lemon juice, and observe the vast superiority of the latter in point of freshness and vigour in the blacks. Or compare a transparent positive upon glass which has been made by the common wet collodion process with one which has been made by the albumen process, and observe the great superiority in point of vigour of the latter. The former may be fairly compared to a silver print upon plain paper, and the latter to one upon albumenised paper. Or compare the former print with a transparency which has been printed by either the Woodbury or the carbon process, and note the greater vigour of the latter, in which the pigment has been mixed with gelatine. Or compare an ordinary iron-developed negative by the common wet process with a negative upon a dry plate which has had an organic preservative applied to it, and observe in this case also the superior vigour of the latter, as well as the greater variety of colours which may be obtained in this way.

These facts seem to leave but little room for doubt that in all our printing processes the material which forms the blacks of the picture should be properly blended with a suitable kind of organic matter in order to give what is called "juicy vigour" to the proof, and I think it not unlikely that some of the printing processes with the common metals, recommended some years ago by Mr. C. Burnett, of Edinburgh, would have been received with more favour if a suitable means of introducing organic matter along with the darkened material of the image had been devised. Prints produced by means of the salts of uranium, iron, copper, &c., did not seem to me to err so much from their unpleasantness of colour as from their dryness and absence of vigour, owing to their having been plain paper prints devoid of organic matter.

I will now point out how glass transparencies may be printed upon wet organified collodion films, so as to present more vigour than such as are commonly produced by the wet collodion process in its ordinary form, as well as a greater variety of beautiful colours, ranging between warm brown and deep purple tints.

The collodion may be such as is commonly used for portraiture. It need not contain more than the usual allowance of a soluble bromide, nor need it be made with a special kind of powdery pyroxyline. The nitrate bath may also be that which is in common use in the dark room. If the collodion and bath work well in the common wet process they will answer perfectly for that which I am about to describe.

When the film has been excited in the usual way it must be rinsed with clean water, in order to remove not all, but the greater part, of the free nitrate of silver which clings to it. When the collodion contains as much as three grains of cadmium bromide (or its equivalent) per ounce the film may be thoroughly washed; but when it contains little or no bromide more free nitrate of silver must be left in it. Experience alone can determine the best amount of washing which films made with a particular collodion may require. The operator will observe also the peculiar shades of colour of the print, which seem to depend upon more or less washing of the film. The washing water should not contain any saline matters; it should be clean rain water filtered through a carbon filter. This remark will be found to be important, and one of the great secrets of success.

When the film has been excited and washed, it must be organified by pouring over it some suitable organifying solution. It is then ready for the camera, and should be exposed at once. I am assuming, of course, that the transparency is made by copying from the negative in a suitable copying camera. The image must be developed immediately after exposure by a mixture of acidified pyrogallol and nitrate of silver. The acid used to acidify this mixture had better, according to my experience, be acetic acid, although no doubt a variety of different effects may be produced by using other organic acids, such as citric, formic, malic, succinic, lactic, benzoic, &c. More experiments are wanted in this direction.

It now only remains to discuss the best kind of organifier to employ. Some of those which are used in the dry processes—tannin, for instance—will be inadmissible here on account of the free nitrate

which may remain in the film, and which would instantly produce discolouration with them. According to my experience albumen is the best organifier to employ, because it is of invariable composition, unadulterable, and yields not only the well-known brownish-yellow tints, but also a great variety of beautiful sepia and violet shades, along with the highest attainable degree of vigour. It should be diluted with water, the amount varying from an equal volume to about four times the volume of albumen, according to the effect which it is desired to obtain.

The above process is a wet and not a moist one; there is, consequently, no necessity to add any hygroscopic substance, such as glycerine, to the diluted albumen, since the plates are used as soon as they are prepared. When the collodion contains the full dose of a soluble bromide, such as is required for dry plates, the film may be washed entirely free from nitrate of silver, and then any of the common preservatives for dry plates may be employed. Albumen and gelatine will give yellowish-brown tints, syrups and sugars black tints, and tannin red tints. The final colour and vigour of the transparency will also depend somewhat upon the time of exposure and the amount of silver in the developer. All these little points will be learned by experience, and do not require to be discussed here.

The process is not new, having been suggested in this Journal last year by me, and approved by Mr. Buxton. It is slightly more troublesome than printing by the common wet collodion process, because it involves washing the film and coating it with an organifier; but this is quickly done, and the artist is rewarded by the superior vigour and beauty of the results obtained.

I have only to add the following caution respecting the fixation and final washing of these prints. They do not require any toning, and should be fixed with a fresh and strong solution of hyposulphite of soda, precisely as negatives are fixed; but I have found that, unless the films be very thoroughly washed after fixation, the image is liable to fade badly. During some experiments hastily made by me last year with this process a few plates were put away before being thoroughly washed, and on looking at them a few weeks afterwards I found that they had all turned to a sickly yellow. Was this owing to the presence of the albumen in the films? They had been fairly though not sufficiently washed. Perhaps the films may have been rendered more impervious to water than an ordinary collodion film by the presence of the coagulated albumen in it, and this may have prevented the complete removal of all traces of hyposulphite by the fair amount of washing which they had received. It is worthy of note that the faded transparencies were those which had exhibited the most beautiful shades of plum and violet colour.

Thomas Sutton, B.A.

## NOTES ON PASSING EVENTS.*

By a Peripatetic Photographer.

Mr. Solomon suggests that the time has come when amateurs must be enabled to conduct photographic work without soiling a white kid glove. I have the happiness of being more or less intimately acquainted with a large number of amateur photographers, but I do not believe that among them all there is one who is afraid of wetting his fingers in the pursuit of his art, much less one who would harbour the desire, no matter how dimly conceived, of working with white kid gloves. There is enough that is objectionable in photographic practitioners without introducing the dandified element. White kids may be necessary to certain persons when operating, on the same principle as scenting the ocean with rose-water or *eau de Cologne* is considered necessary to enable other delicately-strung individuals to bathe; but, persons of this class, if any such really exist—of which, I have my doubts—must be advised to have nothing whatever to do with photography, of which stains form the very foundation stones; but rather seek amusement and recreation in the qualitative testing of the more fragrant essential oils, or in the more purely literary employment of writing to express their pity for those who have, by choice or necessity, to dabble among those unsavoury olefacients, of which sulphuretted hydrogen is a type. From amateurs of this sort—good Phœbus deliver us!

"The lens you mention is said to be quite free from flare." This is an extract from a deliverance I recently saw in the *Answers to Correspondents* column. What I wish to ask is this—Why cannot the Editors take their readers, as a whole, into their confidence and say whose lens or what lens it is that a certain "Lionel" has been writing about, and which is said to be free from flare? Surely such a subject possesses interest to others than the inquiring "Lionel;" and hence why not insert in such an "answer," for the benefit of readers generally, what lens it is or is said to be "*quite* free from flare?" You may say in reply that such a course would not be for the interests of optical advertisers; but this would only be a confession that advertisers control the freedom of expression in the Journal, which, of course, would not be admitted. But, to leave the dangerous ground of commercial and editorial policy, let me say a word or two on flare. Owing to the combination of parts in a lens of the compound *genus* each particular element of the optical group, while working with its fellows to produce an effect as a whole, also does a little business on its own account by means of reflection or refraction, or both combined; and, as a consequence, just see what a host of little images are apparent when one directs at arm's length an ordinary portrait lens towards a candle flame! Minute images of the flame are formed in shoals all along the axis of the lens—some of them are inverted and others non-inverted; and if, by reason of the adjustment of the lenses of the combination, one of these false images be brought to a focus, or nearly so, on the ground glass along with the primary or principal image there arises a bright central flare spot. But what I desire to show just now is that *every one* of these little images we see when holding up the lens to view the candle as I have indicated really does affect the brightness of the image, although it may not appear to do so. These images are formed by rays of light passing through the lenses to the spot where they come to a focus. This assertion will, I venture to say, be considered as axiomatic. If they do not produce a well-defined spot of flare, either in the centre of the plate or elsewhere, it is because they have been diffused over the surface of the plate, and in consequence of such diffusion they must of necessity affect the brilliancy of the negative. If reflections and false images are to exist—and I do not see how they can be entirely got rid of—it is the duty of the optician to cause them to fall outside rather than inside the lens. In the former case they pass away into the outer world of nature and do no harm, whereas in the latter case they necessarily find their way to the surface of the sensitive plate in either a concentrated or a diffused form.

The writer of the February *Notes from the North* considers it to be bad policy to purchase a secret process, or, in other words, to give money for trade information one does not possess. He gives as a proof of the soundness of the negative action recommended an instance of something a professional photographic friend of his bought, which turned out to be, in his estimation, not worth the money that was "expected," for I infer the vendor had been foolish enough to sell the secret on credit. But because a suspicious-looking sovereign may have been offered to us once, or oftener, surely it is unphilosophical to decline in future to receive any more sovereigns. But apart from the instance given, let us look at the principle. Is it right that we should pay for definite information we require but do not possess? That is the whole question involved in the traffic in secret processes. I consider it savours of Quixotism to expect that anyone who, after the expenditure of money, labour, or even the exercise of his reasoning faculties—faculties the training of which has involved a large pecuniary outlay—shall have completed an invention or discovery by which he is a gainer in his business ought to be tabooed because he does not make to those of his fellow and rival tradesmen who have not engaged in similar research a gift of the fruit of his labours. The principle of patents applies to secret-process vending, viz., remuneration for information given; and while it is in accordance with the frailties of human nature that we should all desire to obtain as much information as we can without paying for it, still, so long as man cannot live without the aid of "filthy lucre," so long will it be unwise, nay unjust, to raise an outcry when adequate remuneration is required for information. I do not refer to the value, or want of it, of any secret nostrum or processes which have previously formed the subject of such negotiations, but rather to the *principles* involved in the negotiations.

* Concluded from page 114.

## FOREIGN NOTES AND NEWS.

Nitrate of Alumina in the Printing Bath.—M. l'Abbé Laborde on the Bromide and Collodio-Bromide Processes.

The following photographic notes from the pen of one of the veterans of our art—M. l'Abbé Laborde—will, no doubt, interest our readers, whom we need not remind that the venerable Abbé was one of the founders of the present method of carbon printing, by suggesting, contemporaneously with Mr. Blair, of Perth, the right principle on which that process should be conducted.

For preserving sensitive positive paper the Abbé recommends to add nitrate of alumina to the printing bath in about the same pro-

portion as the nitrate of silver. This, he tells us, will preserve the whiteness of the sensitive paper for a considerable time. The advantages of the method over others which have hitherto been employed for the same purpose are said to be that the nitrate of alumina coagulates the albumen in a similar way to nitrate of silver, and thereby not only gives more brilliancy to the image, but prevents the discolouration of the nitrate bath by the introduction of uncoagulated albumen into it. The sensitive paper thus excited does not dry quite so hard as when floated upon an ordinary nitrate bath, but by remaining limp is more easily applied against the negative. The prints, however, tone slowly, which is mentioned as a defect.

In the bromised collodion process the Abbé tells us that the smallest quantity of a soluble iodide in the collodion is injurious to the result. Bromide of silver, he says, is formed so slowly in the nitrate bath that it is necessary for this reason to increase the quantity of soluble bromide in the collodion, and of nitrate of silver in the bath. This difference between the behaviour of iodide and bromide of silver he believes to be due to the difference of permeability of these salts to water, the bromide forming a more compact mass than the iodide, which, therefore, retards the conversion of the soluble bromide beneath. In order to increase the porosity of the film he has made numerous experiments, the result of which is that he recommends the addition of glycerine to the collodion, in the proportion of ten or twelve minims of glycerine to one hundred cubic centimetres of collodion. The film can then be properly excited in about five minutes in the strong nitrate bath. It is well, also, to add to the same quantity of collodion three or four drops of alcohol in which some nitrate of silver has been dissolved. This will precipitate a small quantity of bromide of silver, and the collodion will present a permanent opaline tint.

The collodio-bromide emulsion process, he tells us, has not yet realised all the hopes that were formed of it. Although very simple in appearance it is troublesome, because it is difficult to guard the emulsion from the light, and, also, because the emulsion becomes gradually impoverished by the precipitation of the bromide of silver, which, we suppose, the cautious Abbé objects to shake up. He finds that by adding a little acetic acid to the emulsion this precipitation is retarded, and sometimes arrested completely. Acetic acid, we are told, is one of the products of the decomposition of ether exposed occasionally to the air; therefore, if a difference be found in the property which any sample of collodion may possess of holding in suspension the bromide of silver, that may be due to the state of decomposition of the ether.

The Abbé concludes by remarking that the number of amateurs who employ the collodio-bromide emulsion process is at present very small, and he believes that if photography upon glass had made its *début* with that process it could not have failed to receive an improvement which would consist in the separation of the materials, and the employment of the process with the bath in preference. We are promised more of these interesting notes in a future communication.

The last number of the *Journal de Photographie*—a journal published monthly in Paris—contains a very pretty portrait by M. Geymet's collotype process.

## ART-CRITICISM.

[A communication to the Edinburgh Photographic Society.]

To be in strict accordance with its title this paper should treat of the art of criticising art; but my aim is merely, by making some general remarks bearing on the subject, to arrive at some particulars regarding photography.

Photographic societies do right in fully discussing the science of photography; but, if too exclusively confined to that, an impression may be made that the means employed are more important than the end to be attained. At any rate, our art lags behind our science. The necessity that lies upon photographers in general to study good pictures and the laws of art has already been well enforced here in the paper read by Mr. Mackay, and in remarks by Mr. Macbeth and others. I would add that it is also desirable that they should come to an understanding of what fine art is—its capabilities and limits, and its relation to the artist, the public, and the times; for a thoughtful consideration of such topics is suggestive of much that may enable the artist to take his true position. As my remarks tending in that direction must necessarily be concise, I have ranged them under separate headings in the hope of making them more distinct; and I cannot think that our time is wasted by having several evenings this session devoted to subjects bearing on photography as connected with fine art.

*Science and Art.*—On these two related yet opposed words the civilisation of the world turns; the one gathering in the abstract what the other embodies in the concrete. Lord Macaulay said, in his dashing way, that "every well-informed schoolboy has now more scientific knowledge than Sir Isaac Newton possessed." The reason of this spread of knowledge is evident. A few colossal intellects, looking into the secrets of nature, put them into formulæ to be handed down as heirlooms—centres of ever-increasing cumulation. Nothing of it is lost. And mechanical art, a child of science, has kept pace with its parent. The master-spirit lays his hand (say) on steam or electricity, and a thousand lesser men carry these into endless ramifications. Thus in our century we have, for instance, the kingdom lighted with gas, steam navigation, the spinning-jenny, the locomotive, the tubular bridge, and the stretched wire that carries our whispers to the ends of the earth. But, observe, this kind of art can be fixed in formulæ, as measured by the yard or pound, and handed from generation to generation with the certainty of still increasing. Nothing of it is lost. But what of fine art? It is wholly different. Raphael, Shakespeare, and Beethoven cannot bequeath the secret of their working to be carried on by others. We cannot say here that nothing of it is lost. The master-spirit dies and the oracle is dumb. Fine art, then, differs from other art in this—it cannot be measured to be put into formulæ. Its appreciation depends wholly on a certain endowment of the artistic faculties.

*Taste.*—When the artistic faculties are directed on a subject they arrive at a certain judgment concerning it; that judgment is what I mean by "taste." It follows that the more perfect and duly balanced these faculties are the more perfect will the resulting taste be; but the kind of criticism generally pronounced on works of fine art lead us to fear that these faculties have, generally speaking, no great development. In fact, good taste is very rare. The capable critic views a picture in its totality—the design, the composition, the execution, and the result of the whole; and the conclusion he arrives at—that is, the expression of his taste—will be good or bad in proportion as his faculties are well or ill balanced.

But the general community pursue quite a different line. They are apt to judge of a picture either solely by the subject it represents or, if they have an extraordinary endowment of our common inheritance, vanity, they will pick you out before you can wink what they call a fault, and depreciate the artist by way of exalting themselves; or their admiration is wholly devoted to details. Their limited vision can see nothing in a picture but the clear, brilliant details:—"What a pretty boy!" says the old lady. "Oh! that darling of a dog!" cries the girl. And "How very clearly the twigs of that tree come out!" quoth *paterfamilias.* If any one doubt that such is the common run of art-criticism he can easily put it to the test. Let him take a dozen or so chance companions—not artists of course—one at a time, to see some pictures, concealing the names of the artists, and if he be not amused and amazed at the remarks he hears it is probably time for him to think of weighing himself in the balance.

As a sample of the world I shall give a *bonâ-fide* experience. Last autumn I visited the Smith Institute, in Stirling, which contains an excellent collection of several hundreds of ancient and modern paintings; among others a "Murillo," lent for exhibition by Sir William Maxwell Stirling—probably the finest "Murillo" in Britain, and certainly not surpassed in our public galleries. During my three visits of several hours each I saw only one individual stop to look at this exquisite painting. Out of curiosity I took note of what were the chief objects of attraction; and I am sorry to say they were not the best pictures. "Distinct twigs," "Darling dog," and similar details carried the enthusiasm. And these people were not mere benighted natives; they were mostly tourists, English ladies and gentlemen, kindly stopping to patronise provincial art, on their way to the Trossachs to patronise provincial nature. It reminded me of the long ago, when a *daft* man, a tourist in his way, in a pair of red whiskers, walked and re-walked all day about the Brig o' Turk, with a thrust-out hand, demanding a penny in a Gælic shout; I, like a boyish Samaritan, offered him a shilling, which put him in such a fury that my discretion got the better of my valour at the rate of eight miles an hour! So sad, to see people prefer copper to silver, whether at the Brig o' Turk or in a picture gallery! The conclusion I wish to state is that the taste of the general community is almost wholly confined to details, and that their opinion of works of fine art is of no great value, to say the most of it.

*Details.*—The passion for strikingly, staringly graphic details is so universal that it may take rank among the "signs of the times." And it is not a bad sign, in so far as it indicates a spread of intelligence in the community—not capable of comprehending a subject in its totality, but still sufficient to take an interest in it. Yet this very proof that there has been some advance measures how small that advance has been. It is self-evident that when a subject which has been restricted to the smaller circle of intellects trained in that department is to be brought before the general community who have not been so trained it must be presented in a different aspect, and the abstruse and ideal must be interpreted simply through their details; in other words, to suit the populace they must suit the popular comprehension and taste. A kind of deterioration inevitably takes place.

In literature we find how this has taken place as the circle of readers widened throughout the community. Themes, which were formerly

confined in tough volumes for the learned trained in that department, are now broken into details for the popular magazines. The solid style of Hume's *History* has given place to the brilliant details of Macaulay. The thoughtful novels of Fielding have gradually degenerated into the endless details of Dickens. Dickens, with all his genius, wonderful invention, power of individualising, broad humour, and sentimental pathos, was chiefly indebted to his endless and unequalled power in graphic details. Fortunately for his unrivalled popularity, he had no faculty of generalising. His whole works are made up of details and details. His successors, with rare exceptions, in poverty of genius follow the path in which he triumphed, and get their novels read by stuffing them with details, especially of furniture and dress, said to be dear to the better half of humanity, and with descriptions of Nature, which, fortunately, she cannot hear. No poetry is popular now unless it is choke-full of pretty details. The giants are out of date; Shakespeare himself has become heavy, and Milton decidedly dull. The argument might be strengthened by considering the theory of what is called the music of the future. Architecture pays more attention to details than to proportions. And what of art? Has it withstood the tide of this popular demand? No; it has not.

*Fine Art.*—The central principle of fine art is the same, whether embodied in poetry, painting, music, or other mode. It has one soul, so to speak, but different bodies; always the same thing embodied, whatever the instrumentality may be. It may be considered as having two departments, which, for distinction, I shall call the "higher" and "lower" platform. When a picture gives details so as to represent its subject, without carrying you in *feeling* beyond it, it is a work of art on the lower platform. When a picture gives the necessary details of its subject, so as to carry you beyond it, rousing the vague impressions that are left in us by the experiences of life, so that we have a feeling of the universal, it is a work of fine art on the higher platform. De Quincey, in one of his works, talking of grand music, says—"It dilates the heart into a capacity for the infinite." This is the same idea. He does not say that it suggests grand ideas and excites the imagination—of course it does that, as almost anything may do—even the grunting of a pig, or the most wretched daub; but as *fine art* it expands the *heart*, rouses the emotional impressions of our being, boundless, infinite—a feeling of the universal. And thus it ascends from art, the lower platform, into fine art, the higher platform. Fine art includes art, and what it embodies will excite the imagination, as any work of mere art will; but as *fine art* it appeals directly, as its chiefest function, to the highest part of our being—the emotional—in which are hived the impressions of our lifetime. To put it in a figure—the emotional is the bank in which we hoard, and from which we draw out the precious wealth of life; and "thought" is merely as a porter at the door, pointing the way and keeping things in order. Fine art does transact with the porter at the door; but only in order that it may pass on to draw out the inner wealth of the bank. Art never gets a step or two beyond the porter.

In the palmy days of fine art there were comparatively few painters—men whose innate genius impelled them to the work—and they had the advantage of working for a comparatively limited circle, and not the general community, who received their Madonnas, and the like, only as symbols of religion. In our later times, as the demand for books increased, under the auspices of the march of intellect, so gradually arose a demand for pictures; and academies of art were instituted to meet the demand, and elevate the public taste if they could. Let us look at this idea in the glass of another fine art. What would have been said of academies proposed to train men to become poets? The idea would have been received with more than a little laughter. Yet you might turn out a thousand men per annum to write the pretty sort of verses generally found in magazines, which are appreciated by the general public, just because they suit their taste, being full of details and little else. In fact, your men would be poets in everything except "the vision and the faculty divine." You could not expect them all to be Homers.

Now, let us turn the idea back to the academies of art, and ask—If you cannot train men to be poets on the higher platform, can you train men to be painters on the higher platform? The answer must be the same in both cases—No! You may teach them the art of drawing, colouring, and composing in so far as that can be taught, and they will turn out pretty pictures, of all shapes and sizes; but you could not expect them all to be Raphaels. Britain, like other countries, has its few pre-eminent painters, and many more of eminence, whose position would have been the same if academies of art had never existed. I do not allude to these, but to those who could never have been artists but for their training in an academy. Unable to reach above their height, these men necessarily remain on the lower platform, devoting themselves to the art of giving what Sir Joshua Reynolds calls "the punctilious delineation of details." When you consider that this style of painting is that most appreciated by the general community, and also the great number of men who produce such pictures, you see at once how the demand and supply fit into each other, how the appetite for details is fed, and how such feeding increases the appetite. In fact, such has become the rage for brilliantly-graphic details that even men who might achieve higher work are found accommodating themselves to the popular demand of the day. The public is the great patron now; and it is to be feared that the noble idea of the artist elevating the patron's taste may be resolved into the patron giving law to the artist. The pocket with the cash in it commands the situation.

These remarks are not intended to disparage the thousand artists of the day. They fill their place, do their work, and meet the public demand. They produce very pretty and pleasing pictures, that give delight to thousands; and the skill they, as a body, have acquired is quite wonderful. It is admitted now that there is a Scotch as well as an English school of painting of high standing; and the nation has reason to be proud of both. The annual exhibitions in Edinburgh, no less than in other places, show not only that there is a general excellence in manipulation, but that many artists have a feeling of fine art, which would probably be more pronounced if they had not to suit the public taste. On the whole, these exhibitions have, no doubt, to a certain extent, a refining and elevating effect on the public, yet not of the loftiest kind. Pretty detail and high finish is too much the rule; and there is too little evidence of the simple greatness which results from a high aim and a lofty habit of contemplation. W. NEILSON.

*(To be concluded in our next.)*

## Our Editorial Table.

THE FIVE SENSES. By JOHN WERGE.

WE have before us a set of stereographs or photographs, &c., illustrative of the senses; and in attempting to review such works it is not easy to decide whether it is easier to photograph the emotions or convey to the minds of our readers an idea of what these photographs represent by words alone. As all who are acquainted with the passions or emotions of humanity are aware, the expression of any distinct or combined passion is not confined to the action of the muscles of the face, but other muscles of the body and limbs are brought into active play in expressing the sensations aroused by pleasant or unpleasant action of the brain. It is for this reason that artists and sculptors cling so tenaciously to the nude figure to enable them to give adequate expression to their own feelings in the forms and faces of their creations; and it is for this same reason, undoubtedly, that Mr. Werge has chosen to represent the senses photographically by presenting an almost nude model.

Taking them in the order in which they are placed before us, the sense of *Smelling* is expressed by an almost perfect repose. The limbs and muscles throughout the body are at rest. The only members visibly active are the hand holding the flower, and the nostrils, while the other features are expressive of a quiet, pleasurable sense of smell. The sense of *Tasting*, being a much more active one, is full of animation. The whole figure is in action, and an expression of excitement runs through every limb, from the tips of the fingers holding the white currants to the toes on which the leg forming the lap rests. The muscles of the body indicate the sympathy of the stomach, and the desire to eat is strongly expressed in the facial muscles and the inattention of the other hand, which is partly open and allowing the fruit to fall from the leaf to the floor. *Feeling* is very difficultly yet appropriately rendered. The figure is erect and firmly planted on the ground, without the slightest appearance of fear, and the sense of touch is prettily expressed by the middle finger of one hand daintily propping the end of a feather which is held by the other, while a mixed expression of curiosity and wonder is diffused over the face. *Hearing* is represented by a position indicative of wonder and repose, and the old symbol of sound—a shell—is held to the ear by the right hand, while the left by its action seems to express, as with a tongue—"Be still that I may hear." *Seeing* is characteristically expressed by the model looking into a mirror. The right hand is occupied in holding the mirror, while the left holds back the clustering locks, the face being expressive of intense satisfaction. The model is the same throughout—a pretty little girl in age numbering about six summers.

Mr. Werge has evidently studied Le Brun, and we earnestly recommend all our readers who aim at more than mere portraits to do likewise. These photographs possess much merit as photographic works, and evince the great technical skill and artistic taste of Mr. Werge.

## Meetings of Societies.

### LONDON PHOTOGRAPHIC SOCIETY.

THE ordinary meeting of this Society was held on Tuesday evening last, the 9th instant. On the newly-elected president, Mr. Glaisher, F.R.S., taking the chair, he was received with a few audible expressions of disapprobation. He hoped the utmost unanimity would reign among them (applause and hisses).

The minutes of the previous meeting having been read, Captain G. H. Verney was elected a member.

Captain Abney then read a paper in which he gave an account of his photographic operations in Thebes in connection with the recent transit of Venus. He exhibited a number of transparencies and negatives taken on that occasion. We expect to publish the paper next week.

In reply to a question by Mr. Blanchard,

Captain ABNEY said that the average temperature at Thebes during the day ranged from 90° to 95°, but at night it sank down to 40°. He paid close attention to the thermometric indications, and especially to those of the wet and dry bulbs, by which he regulated the exposure in the photoheliograph.

The CHAIRMAN expressed his gratification at the tribute paid by Captain Abney in his paper to the sappers by whom he had been so ably assisted. When he (the Chairman) was engaged in the triangulation of Ireland, he, too, had been assisted by sappers, by whose skill and intelligence his labours had been materially lightened. From the paper just read they gathered how important it was that gentlemen who were selected to do a certain piece of work should have had experience beforehand. Captain Abney had grappled with the difficulties which surrounded him with a firm resolve to overcome them. He then conveyed the thanks of the Society to that gentleman for his paper.

Mr. YORK exhibited by the magic lantern a large collection of negatives of the transit taken at the Cape of Good Hope by Mr. Bruton, a photographer there. They were taken in an ordinary camera with a repeating back, the lens employed being one of sixteen inches focus. The size of the sun's image on the negative was, he said, slightly under half an inch. The exhibition was accompanied by a few descriptive observations by Captain Abney, who showed, by the lantern, a view of the observatory that had been erected in Thebes. After the thanks of the Society had been conveyed to Mr. York,

The meeting was declared special to take into consideration the alteration of one of the laws by the substitution of one word for another. A long discussion ensued in which the general reader would feel no interest. The "new" laws were, however, declared to be so bad and contradictory as to stand in need of entire revision.

The meeting was then adjourned.

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We now give the report of the Council, which we were unable to insert last week:—

## REPORT OF THE COUNCIL.

FOR the first time in the history of the Society the report of the Council does not comprehend a full period of twelve months, inasmuch as the present Council and Officers were not elected until the 19th May last, when at a special general meeting a new executive was created by ballot. The record of the past year would, however, be incomplete were we not to commence by referring to the resignation of the president's chair by Mr. Glaisher, after six years of active and excellent service to the Society. Our late president has carried with him in his retirement a grateful recognition on the part of the Society of the energy and spirit with which he conducted its affairs during that term of office, and a considerable measure of regret that these services were not continued, especially after having so successfully steered the course of the Society through a period of some difficulty and embarrassment. The thanks of the Society are due to Mr. Glaisher for this estimable service, and will remain recorded in its annals upon that ground.

Notwithstanding the difficulties inherent to a sudden change in the constitution of the Society and selection of new officers, some good work has been accomplished. Thirteen communications have been read at meetings of the Society during the past year, and the usual exhibition held in October, which was well supported and contributed to by the members, and received favourable notice from the press and general public. Mr. Crawshay's competition was the means of bringing some additional works under the same roof, and certainly added to the interest of the collection. The exhibition remained open for more than three weeks, and opportunities were afforded for examining the pictures in the evening upon seven occasions, in addition to the private view reserved for members and their friends at the opening *soirée* on the 13th October. The total number of exhibitors enumerated in the second edition of the catalogue was eighty-seven, exclusive of the Crawshay competitors, and the Society received a considerable accession of new members from this list. The financial aspect of the exhibition will appear in the treasurer's balance-sheet.

The papers read before the Society since April last are as follow:—

*On Printing and Toning Collodio-Chloride Paper*, by George Bruce.

*On the Reproduction of Negatives by the Powder Process*, by J. B. Obernetter, of Munich.

*Remarks on the Asserted Influence of Colouring Matters on the Reduction of Silver Salts*, by John Spiller.

*On the Collodio-Chloride of Silver Process*, by George Hooper.

*On the Sensitiveness of the Surface of Tinted Bromide of Silver to the Different Colours of the Spectrum;* also a *Note upon Focussing in Spectroscopic Observations*, by Dr. Van Monckhoven.

*Gelatine as a Vehicle for Silver Salts in the Production of Negatives*, by Joshua King, M.A.

*On the Gelatino-Bromide Process*, by R. Kennett.

*A few Notes on Alkaline Development*, by Colonel H. Stuart Wortley.

*Experience in Taking Direct Life-sized Heads*, by John Chaffin.

*Away-from-Home Photography*, by Edward Viles.

*Photographic Experiences in New Zealand*, by D. L. Mundy.

*On the Nitre-Sulphur Light for Photographic Purposes*, by John Spiller.

*The Origin, Aim, and Achievements of the Photographic Society, with Suggestions as to its Future Development*, by George Hooper.

At a special general meeting held on the 30th June the designation of the Society was changed and a revised code of laws passed as those of "The Photographic Society of Great Britain," in accordance with which a general system of ballot will in future govern the election of president, treasurer, and members of Council.

Twenty-five new members have been admitted into the Society during the year, four have retired, and the Council mourn the loss of a distinguished colleague in the late Mr. O. G. Rejlander, who died on the 18th ult., and in respect of whom an obituary notice is appended.

Marking the advance of photography at home and abroad the Council notes the establishment of a new society in the West Riding of Yorkshire, and observes with unmixed satisfaction the founding of the Belgian Photographic Association. The South London, Manchester, Edinburgh, and other provincial societies still continue in active operation. Carbon printing has made some technical progress, and the gelatino-bromide and emulsion processes have been certainly advanced a stage. Preliminary lighting, as a means of reducing exposure, has been further studied and applied, and Woodbury printing popularised; but with so many facilities existing for the publication and discussion of photographic novelties it is to be regretted that no greater triumphs have been achieved during the past year. It is a source of gratification, however, to report success in the extended scientific use of photography as a means of recording the phases of the transit of Venus, which occurred on the 9th of December. On that occasion one of its most distinguished members, Captain Abney, took an important part; Lord Lindsay, a member of the late Council, also fitted out expeditions, which contributed valuable results.

OBITUARY: O. G. REJLANDER.—On the 18th of January died our eminent colleague, Oscar Gustavus Rejlander, in the sixty-second year of his age. He attended the December meeting of the Council, bringing with him an admirable enlarged portrait of his former royal patron, the Prince Consort, finished in monochrome. His health failing fast, he, in a feeling letter to the President, tendered his resignation as a member of the Council; and at the last meeting a resolution of condolence, proposed by Dr. Mann and seconded by Mr. England, was conveyed to him in the following terms:—"The Council have received Mr. Rejlander's resignation of his seat at their board with very sincere regret, and desire to convey the assurance of their deep sympathy with him in his illness, coupled with the expression of their most cordial regard." By birth the son of an officer in the Swedish army, and by training an art-student from Rome, Rejlander took up the practice of photography and settled in the town of Wolverhampton, where he produced *The Two Ways of Life*, a work of great artistic merit which gained for him a considerable reputation. Designed for showing the art capabilities of photography and the possibility of "combination printing" the work was sent to the Manchester Exhibition of Art Treasures, and was afterwards shown and fully described by himself at a meeting of this Society, held on the 6th of April, 1858, a full report appearing in the journal. Several works of more or less ambitious character, all distinguished for their high artistic excellence, quickly followed, the majority of them being shown at the Society's annual exhibitions, ending with the album of studies laid on the table in 1873, and *Scraps of Expression* and a portrait of Gustave Doré in 1874. A paragraph contained in Mr. Rejlander's communication of 1858 reads now like a prophecy in course of fulfilment, and no apology is required for reproducing it in this place:—"I believe (says Rejlander) a time will come, and that not far distant, when *real art* and photography will go hand in hand, the latter as a means to the artistic end. It cannot be otherwise. Photography is but 'the holding of a mirror up to nature;' and the more thoroughly a mind is imbued with the love for, and a discernment of, the *true* in art the oftener will it plume and refresh itself at the fountain of its inspiration, and draw from its ample, but to many hidden, treasures." For several years past Rejlander resided in London, where he died, and, having been a member of the 38th Middlesex (Artists') Rifle Volunteer Corps, was buried with military honours at the Kensal Green Cemetery in the presence of several members of this Society and many friends who mourn his loss.

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### CASH ACCOUNT.

| 1874. Receipts. | £ | s. | d. |
|---|---|---|---|
| To Balance | 171 | 1 | 5 |
| ,, Entrance Fees and Subscriptions | 248 | 6 | 6 |
| ,, Sale of Journals and Advertisements | 49 | 7 | 1 |
| ,, Admission to Exhibition and sale of Catalogues | 55 | 14 | 0 |
| | £524 | 9 | 0 |

| 1874. Payments. | £ | s. | d. |
|---|---|---|---|
| By General Expenses | 93 | 4 | 2 |
| ,, Journal Account and Editor's salary | 127 | 6 | 7 |
| ,, Medals and Presentation Prints | 46 | 10 | 10 |
| ,, Collector's Commission | 14 | 19 | 9 |
| ,, Expenses of Exhibition | 98 | 0 | 8 |
| ,, Balance at Bankers | 144 | 7 | 7 |
| | £524 | 9 | 0 |

### ASSETS AND LIABILITIES.

| 1874. Dec. 31. Assets. | | | | £ | s. | d. |
|---|---|---|---|---|---|---|
| Entrance Fees and Subscriptions due | £129 | 3 | 0 | | | |
| Less 20 per cent | 25 | 16 | 7 | | | |
| | | | | 103 | 6 | 5 |
| Advertisements outstanding, Journals in stock, &c. (say) | | | | 38 | 7 | 6 |
| Cash balance at Bankers | | | | 144 | 7 | 7 |
| | | | | £286 | 1 | 6 |

| 1874. Dec. 31. Liabilities. | £ | s. | d. |
|---|---|---|---|
| General outstanding Expenses, estimated at | 25 | 0 | 0 |
| Balance in favour of Society | 261 | 1 | 6 |
| | £286 | 1 | 6 |

Audited, and found to be correct.

(Signed) J. C. HEAVISIDE, R. C. MURRAY, } AUDITORS.

*February* 2, 1875.

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## EDINBURGH PHOTOGRAPHIC SOCIETY.

AN ordinary meeting of this Society was held in the Bible Society's Room on the evening of Wednesday, the 3rd inst.,—the President, Dr. Thomson, in the chair.

The minutes of the previous meeting and the minute in connection with the death of the late Mr. O. G. Rejlander were read and approved. The following gentlemen were admitted ordinary members:—Messrs. David Small and Thomas Davidson.

Mr. W. Neilson read a paper entitled *Art-Criticism* [see page 126], illustrated with several fine large and small photographs.

The PRESIDENT congratulated Mr. Neilson on the admirable and exhaustive paper which he had read. The paper was one of great value, and showed that he was thoroughly at home in the subject, and that he had given it much study. It had been said that artists were born, not made; but even genius requirede ducation, and he thought the present generation enjoyed greater advantages than their predecessors, in so far that, if one only brought his powers of observation into play, it was impossible to walk along the streets without finding material for instruction. He could remember the time when there was no gas in our streets, and when the shop windows were required for light and not for show. Now, however, matters were very much reversed, and they had in the windows of the print sellers, the furniture dealers, and the china shop, a constantly changing series of museums of art, or art galleries, that were daily exercising an abiding influence on all who cared for such study.

Mr. NORMAN MACBETH was very much pleased with the paper just read, and especially with the pictures by which some of Mr. Neilson's views were illustrated. He was undoubtedly working and writing in the right direction, and both pictures and paper went far in corroboration of what had been so strongly maintained at the previous meeting.

Mr. MACKAY had great pleasure in listening to the paper just read. Especially was he pleased with Mr. Neilson's observations on fine art, which did not consist of minute details, but in a proper working up of the ideal. That, he thought, was well shown in Mr. Neilson's pictures, which, he did not hesitate to say, were equal to anything that had been produced in Scotland.

Mr. ROSS agreed with the greater part of Mr. Neilson's paper, which he considered an able production. Much, indeed, depended on development; and he might say that where it was desired to produce texture the least possible quantity of silver should be employed. More than twenty years ago he had read a paper on the subject before the Photographic Society of Scotland, and had at that time developed with gallic acid alone, without a particle of silver. He thought it might be held as axiomatic—"the less silver the better texture."

Nr. NEILSON said that there was less need for silver in intensifying than was generally supposed. He found that, after fixing, he could get a considerable increase in the intensity by the application of iron alone.

Mr. David Aird then exhibited, and read a paper in explanation of, a camera for landscape work—so arranged that it carried a dozen prepared plates, any one of which could be exposed without the possibility of failure. [See page 123.]

Mr. TURNBULL understood that there had been a camera patented, he thought by Cook, having the same object in view. He had not seen it, but from what he had heard regarding it he believed that now shown to be much better. One great advantage he considered to be the power to take the plates in any order, and that so easily that a mistake seemed impossible. Another advantage was that the camera contained everything in one piece—nothing loose—and so nothing could be forgotten.

Dr. NICOL thought Mr. Aird deserved much credit for the perseverance and labour which must have been expended in having, unaided, produced such a complete result. So far as he could see, the working arrangements of the camera were simply perfect. Probably the best thing he could say regarding it was that as soon as Mr. Aird could lend it to him for a few days he should have one made for himself for the work of the coming summer.

The usual distribution of pictures—on this occasion forty in number—the contributions of Messrs. Sinclair and Mathieson, was then made by lot, and, after votes of thanks had been duly given to Mr. Neilson, Mr. Aird, and the donors of the pictures, the meeting was adjourned.

## Correspondence.

### CADMIUM BROMIDE.—RAPIDITY.—COL. WORTLEY'S STATEMENTS.

AFTER my return home in October last, a year earlier than I intended' having become extremely tired of travelling, I obtained from Mr. Greenwood a complete file of arrears of the Journal. These numbers, as well as those since received, contain a great number of interesting papers, showing how much intelligence is constantly devoted to advancing the progress of photography.

*Cadmium Bromide Calculations.*—This substance seems destined to give a great amount of trouble to experimentalists in their calculations of equivalents. Many readers of this Journal will recollect how many calculations were vitiated four or five years ago by the assumption that the formula of cadmium bromide was Cd Br, analogous to Ag Br or K Br. In reminding your readers that the cadmium bromide of commerce contained four equivalents of water another fact was mentioned that seems, perhaps, to have been overlooked. The *dried* cadmium bromide is by no means *anhydrous*. If we set ordinary crystallised cadmium bromide in a warm, dry place, the transparent acicular crystals become opaque, and we obtain a substance resembling dry starch—white, floury, and easily crushed to powder. This is the intermediate hydrate, Cd Br + 2HO (using the old notation), according to Rammelsberg, but its constitution is not very constant or certain. Some years ago, wishing to have something positive to go on, I examined carefully the loss of water. Crystals of hydrated bromide weighing 3·450 grammes were placed in a drying apparatus (hot water bath), were kept four hours at 202°, and lost 0·460. Two equivalents of water would correspond to 0·361. The loss was, therefore, considerably over two equivalents. It follows that the constitution of dried cadmium bromide cannot be depended upon with entire certainty.

If a considerably higher heat be applied (200° C., according to Osso Graham) the rest of the water is driven off, and an enamel-like substance is obtained. It does not follow, however, that even this is of certain composition. Metallic bromides in many cases lose bromide by the application of heat, and though the cadmium compound is one of the more stable, still, without a thorough examination, it could not be said that the enamel-like salt could be depended on as being certainly and exactly like Cd Br. There seems no entirely satisfactory solution of this difficulty; even the commercial hydrated bromide is not necessarily of constant composition, being sometimes partly effloresced. It would be best if it could be done without altogether, but, unfortunately, ammonium bromide is not only very insoluble in strong alcohol (especially in the entire absence of cadmium bromide), but also collodion made with ammonium salt does not keep well—it loses sensitiveness and the pyroxyline deteriorates. I have just found that even some cadmium and ammonium collodion a little over a year old is good for nothing. It wrinkles in developing. This collodion contained bromides only. Probably the best plan is to dry the salt carefully at a low temperature till white and floury, and then calculate it as Cd Br + 2 HO—equivalent number, 154. Without great care and some acquaintance with chemica equivalents very awkward mistakes may easily occur.

*Rapidity.*—No branch of dry-plate work seems more interesting than that of emulsions washed after Mr. Bolton's method. It does not appear, however, that a sufficient degree of sensitiveness has yet been obtained to make the process altogether satisfactory. Some, indeed, contend that a high degree of sensitiveness is not really valuable. It is very true that if extended scenery, well illuminated, is to be photographed on small plates one can well dispense with great sensitiveness; but when picturesque bits—in ravines, by streams, with foliage, often shaded in the foreground and middle distance—are to be taken even on plates of medium size, such as $6\frac{1}{2} \times 8\frac{1}{2}$ and $8 \times 10$, sensitiveness becomes very valuable, as one catches one's effect between puffs of wind. Therefore I cannot join in the abuse of *rapidomanie.* The great thing is to get the power—the sensitiveness; that got, one easily controls it. It is, of course, necessary to distinguish between plates that will keep for a few weeks only and those that may lie by indefinitely. And if it do not follow that the highest degree of sensitiveness necessarily gives the most pleasing effects, neither does it follow that a less degree of sensitiveness gives any presumption of such results. A pleasing effect, though not necessarily associated with the highest degree of sensibility, is just as likely to accompany it as any less degree. In my experience the best and most pleasing results have generally come with the most sensitive plates.

*A Rectification.*—I regret to find that the controversy into which Colonel Wortley drew me some time since is not to be allowed to sleep Each party having stated his case, Colonel Wortley having been allowed the last word, I presumed it was over. But in a number of the Journal lately received, Colonel Wortley returns to it, wholly unprovoked. During seven months I had printed not a line in any photographic journal, had not even replied to his observations of last summer, so that nothing could be more gratuitous. Neither should I notice the matter even now, but that Colonel Wortley will not allow me the use of my own formulæ, published a year before he adopted my chloro-bromide process, without charging that I copy from him. Truly a most complete adoption on his part! Regretting, therefore, most sincerely to take up your readers' time and to use my own, I reply.

At page 59 of the present volume, Colonel Wortley says:—"He would be a bold man who would now propose to make an emulsion with ten grains of silver only to the ounce, or would attempt to uphold

the doctrine laid down by Mr. M. Carey Lea, previous to the reading of my paper in 1871, that any excess of over ten grains was not only useless, but injurious to the emulsion." Again: at page 345 of your last volume the same gentleman affirmed that, up to the time of the publication of his paper in 1871, I had "constantly" objected to the use of over ten grains of silver nitrate in an emulsion. The object appears to be to attempt to show Colonel Wortley was the first to use a larger amount. As I had already called Colonel Wortley's attention to the erroneous nature of this claim I shall now take the liberty of placing two passages in parallel columns. The italics are my own.

| | |
|---|---|
| "I am gratified, on the other hand, to find Mr. Lea, after having *till the publication of my paper in June*, 1871, *constantly written down any excess of silver over ten grains* as 'injurious,' and that he 'saw no use in loading down the collodion with silver,'" &c.—H. S. Wortley in The British Journal of Photography, June, 1874, p. 345. | "I have got *much better results* by *increasing the proportion* of silver to *eighteen grains.* Large as this excess is, and all in actual solution when introduced into the collodion, the controlling power of the *aqua regia* is so remarkable that there is not the slightest tendency to fog."—M. C. Lea in The British Journal of Photography, April 29th, 1870, p. 192. |

What I have a right to complain of is the studied and persistent effort on the part of Colonel Wortley to conceal the fact shown in the above extract, and to *have it believed that, because it suited me at one time to use a much less quantity of silver nitrate, I had never done otherwise until enlightened by him.* No pains have been spared on his part to accomplish this object, and to create the belief that he first used a large excess of silver nitrate; but it is impossible that he should succeed.

The above publication was made in your columns in the spring of 1870, and it was only in the summer of the *following year* that Colonel Wortley printed the paper which he quotes. In the meantime I had repeatedly changed my proportions.

In the summer of 1870 (July 1st) I diminished the dose of silver; in the autumn (September 2nd, 1870) I again increased it. I was then, as I have been since, varying the proportion according to my preservatives and results, and Colonel Wortley, who at that time had not written a line on the subject, had exactly as much influence in bringing about the changes as he had afterwards when he was pleased to believe that I was copying from him. A little latter again I discovered the intense sensitiveness given by the cochineal preservative, and found that unless the silver was kept down the images were thin and flat. I then reduced the silver to a bare excess (December 30th, 1870).* Then, again, I found that *pyrogallic acid* was an excellent preservative. At first I used it with the same small doses of silver, but presently found that I could do better with my older formulæ. I accordingly returned to my quantities of the year previous. Meantime Colonel Wortley had adopted as his own something so nearly similar to these older formulæ, that he at once charged me with copying from him. Perhaps a more anomalous state of things never existed. My work had been so completely taken possession of by another that I was not to use it myself without due acknowledgment. It suited me to return to these earlier proportions, because I began to see that the quantity of excess of silver must be governed by the character of the preservative. To test this idea I tried the less sensitive preservatives, gallic acid and tannin, with a somewhat increased dose, and found they did better with it.

Then I saw that my law was a correct one, and it further occurred to me that as the great trouble with *albumen* had always been its want of sensitiveness, probably even this might be overcome by a very heavy dose of silver. It proved so, and an excellent process resulted. I had thus, step by step, got considerably beyond my older figures—viz., eighteen grains—of 1870 (necessarily also passing Colonel Wortley's sixteen grains of 1871 and subsequent years), and used (with albumen) from twenty-three to twenty-five grains of silver, which, for some perfectly unintelligible reason, Colonel Wortley is pleased to consider a tribute to his views. In fact, the whole cause of this investigation, which began years before Colonel Wortley commenced with emulsions, was conducted without the slightest reference to his views or opinions. I simply looked upon him as one who had taken up my process with a speculative view, and have lately had to go back to examine his papers to ascertain what was the quantity of silver nitrate that he did actually use. I was surprised to find it so small as sixteen grains, having supposed from his general expressions that it was much larger. My own investigations would have taken the same course had no such person as Colonel Wortley been in existence, and I am not, I need scarcely say, indebted to him for one iota. The indebtedness is exclusively the other way. I am at the present moment using the very same excess of silver nitrate that I used in Sept., 1870, long before he began to publish, viz., between four and five grains. Nothing can be more utterly preposterous than for Colonel Wortley to claim, as he does, the ownership of all processes involving the use of more than a given amount of silver nitrate. I exposed this thoroughly long since. Colonel Wortley made what answer seemed to him good, always misstating the facts, referring always to the one particular formula published whilst I was using cochineal, and persistently ignoring the whole of the previous publications. I was content to leave the matter to the common sense of your readers, and considered the whole thing of the past, when Colonel Wortley sees fit to reopen the question, with the ghosts of these dead claims.

The facts, then, are—that in 1870 I worked with large excess of silver nitrate because my preservative suited with it. Next year, whilst I was using much less (also because it suited my preservative), Colonel Wortley went to work with formulæ virtually the same as mine of the year previous. And when, returning to my older preservatives, I ventured to use my older proportions of silver nitrate, I was instantly congratulated by Colonel Wortley for adopting his views!

And now should Colonel Wortley see fit to reply to this rectification, I think my past experience enables me to foresee how it will be done. The essential points will be passed over in silence, and a great deal will be said on side issues that have no bearing whatever. I should expect another discussion of the question as to whether my ten-grain formula of December, 1870, contained an excess of silver or not. This is Colonel Wortley's stalking-horse. It did, but whether it did or not, what possible bearing has it on the point at issue? How would that dispose of the eighteen-grain formula of April 29, 1870?

I make this rectification with very great regret—so much so that I have more than once felt rather willing to let Colonel Wortley take anything he likes rather than dispute it with him. One consideration only has prevailed with me—*I cannot consent to be placed in the position of not being able to use my own formulæ*—I refer to those of 1870, the year before Colonel Wortley's first attempt with the process—*or others of a similar character, without being charged with virtually copying his proportions of silver nitrate.**

In turning over these back volumes of the Journal I came upon the following passage, which bears curiously upon the present matter.

In the last number for 1869 the Editors, after some friendly words on the subject of the chloro-bromide process, had kindly remarked that in view of the manner in which it had been studied out it ought, even if modified by others, to bear the name of its discoverer. In the following number (January 7, 1870) your intelligent correspondent, the "Peripatetic Photographer," made the following observation:—

"The comprehensive and complete manner in which Mr. M. Carey Lea has given his new chloro-bromide process redounds to his honour as a careful experimentalist. In your leader last week you seem to anticipate that this process will be subjected to such modifications as will warrant the suspicion of the 'modifier' putting in a claim for a slice of the honour of discovery. If this be your meaning, I don't think the British photo-experimental public are deserving of the inuendo, as Mr. Lea will himself, I think, be one of the first to admit."

Undoubtedly, with an exception. My process has for years been advertised as "Colonel Wortley's bromo-chloride process."

This chloro-bromide process already belongs to the past. The process which I send you today—the chloriodo-bromide process—exceeds it so much in sensitiveness that it must in time, I think, take the other's place. M. Carey Lea.

*Philadelphia, February* 23, 1875.

* These formulæ will be found collected and summarised at page 434 of your volume for 1871, with exact calculations as to the absolute excess of silver nitrate after deducting the amount required to saturate the alkaline salts and the *aqua regia*, showing an excess in the various formulæ varying from two or three up to four or five grains.

* The British Journal of Photography, 1874, page 345.

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Meeting of the Photographic Society of France.—Boracic Acid in the Nitrate Bath.—Carbon and Fatty-Ink Printing.—"Chassis-Cuivette a Adhérence Capillaire" of Dr. Schaeb.—Multiplication of Negatives, by M. Chardon.—Photomicrographical Proofs by M. Aimé Girard.

The Photographic Society of France held its meeting on Friday evening last, the 5th instant,—M. Martin, of the Observatory of Paris, in the chair. After the reading of correspondence and admission of new members M. Hermagis, the celebrated optician, informed the Society

that he had employed with great success boracic acid in the nitrate bath instead of nitric and acetic acids. "I am not aware," he said, "that this acid has ever been proposed for that purpose, and as it has worked very well in my hands I am happy to inform the members of a chemical agent which does not offer the same inconvenience as the two last-mentioned acids. The use of the nitric acid is, as you are aware, attended with difficulties; and the volatility of the acetic acid makes it very difficult to know whether the bath is always in a normal state. Very often," he continued, "I have used a bath which worked in an admirable manner, and two or three days afterwards gave nothing but foggy negatives, but was immediately restored to its former value by the addition of a little acetic acid. Since I have employed boracic acid my bath works in a very uniform manner. First of all, I neutralise my silver bath with bicarbonate of soda, and then for every quart of liquid I add one drachm of boracic acid."

MM. Braun and Pearson presented to the Society some very fine reproductions and portraits printed by the carbon process. M. Geymet also laid before the Society some specimens of fatty-ink printing, and, in order to judge of their beauty, the same proofs were also printed in silver salts on albumenised paper. Great progress has been made during a short time in this important branch, and fatty-ink printing is making its way rapidly in France.

M. Audouin presented to the Society, in the name of Dr. Schaeb, a very ingenious apparatus for outdoor work with wet collodion. He names it "*châssis-cuivette à adhérence capillaire.*" As its name indicates, the apparatus is at the same time a dark slide and sensitising tray. This tray is made to fit on the camera, and as the bottom of the tray is of ground glass the image is easily focussed. The lens must now be advanced one-eighth of an inch to allow for the thickness of the plate. The dark-slide tray is then taken off the camera and the nitrate of silver solution is introduced into the compartment, which now acts as a horizontal nitrate tray, and is held at an angle of forty-five degrees until the collodionised plate has been laid upon the bottom, when the lid is closed and the tray brought to a horizontal position; this causes the nitrate bath to flow over the surface of the collodion. A slight movement is given to the tray to prevent streaks, and when the operator thinks the collodion sufficiently sensitised he returns the nitrate bath to his stock-bottle by means of a tap. The apparatus now serves as a dark slide. There is no danger whatever of turning it in any way, for the plate adheres tightly to the bottom by capillary attraction. The apparatus is then placed on the camera as an ordinary dark slide, exposed the necessary time, and developed. Dr. Schaeb does this by introducing into the apparatus the solution of sulphate of iron.

I have given a full description of this little apparatus, as I am of opinion it can render service to many readers of The British Journal of Photography who employ tents for taking landscapes. It is advisable when travelling to have as little luggage as possible, and to employ the silver-bath tray instead of a separate slide is a novel idea which is very easy to put in practice; but I am not in accord with the inventor when he proposes to develope the plates in the same tray, for I cannot conceive that a developing agent can be employed in a dish where nitrate of silver is to be used for sensitising plates for any length of time with success.

M. Chardon continued his lecture on the multiplication of negatives which he began at the last meeting of the Society. "The manner I employ to multiply negatives," he said, "is partly known, and consists in an application of the carbon process. Whether we develope a pellicle of coloured gelatine on glass or on paper a positive is obtained, from which positive we can, if we desire, reproduce another negative. In a theoretical point of view this process is exact, but to put it in practice is not easy. If a pellicle which contains but little carbon be employed the proof, whether positive or negative, is very fine but very feeble. If a pellicle containing much carbon be used great intensity will be obtained, to the detriment of its sharpness; therefore the last would be perfectly useless in a photographic point of view. During many years I have sought an agent to densify the pellicle, and I find that permanganate of potash* is admirably adapted for that purpose. If a negative or positive be plunged into a solution of permanganate of potash the intensification will take place gradually and, at the same time, with great regularity. The gelatine decomposes the permanganate of potash, and oxide of manganese is formed. This action on organic matter is so powerful that a negative can be so densified as to intercept completely the actinic rays of light. The solution that I employ with success contains one grain of permanganate of potash for a hundred grains of water. Experience will teach the operator whether it is better in the reproduction of negatives to intensify the negative or the positive. I prefer in general the former. Great care must be taken not to carry it too far; the yellow tint which the permanganate of potash gives to the film must be taken into consideration. It is very easy to print a proof on trial, and, if found too feeble, to plunge it again into the solution for a few minutes. In a commercial point of view, in what way can we employ the permanganate of potash? 1. It can be used in the colouration of positives intended to be viewed as transparencies, as the permanganate of potash gives an agreeable sepia colour to the film. 2. The permanganate of potash makes gelatine insoluble, rendering it fit to receive a galvanic deposit. 3. A cheap imitation of yellow glass for dark rooms can be easily obtained by coating a pane of glass with gelatine and allowing it to remain in a concentrated solution of permanganate of potash. Many other uses could be found, and I am certain that its employment will bring others to light. It is only by studying different chemical reactions that we are enabled to make progress in the art of photography."

* The use of permanganate of potash as a means of intensifying gelatine films was suggested several years ago by Mr. Swan.—Eds.

M. Aimé Girard presented to the Society a collection of photomicrographic proofs, two inches in diameter, which he had taken to assist him in his lecture on the different fibres employed in the fabrication of paper. These proofs were very sharp, showed great tact in the classification, and displayed much skill in the organisation. The eminent Professor informed the members that excess of work prevented him from placing before them that evening the apparatus with which he obtained those proofs by means of the lime light; but he would endeavour at the next meeting to make a few negatives in their presence.

I was the more sorry for this unexpected delay as I have been waiting with impatience to give my readers a description of that apparatus, and, at the same time, of the one I employ in my laboratory at the College of France, but was hindered from doing so by a desire expressed by M. Girard to make the presentation to the Society before publicity was given to that apparatus. E. Stebbing, *Prof.*

3, *Place Bréda, Paris, March* 8, 1875.

## BINGHAM *versus* ARCHER.

*To the* Editors.

Gentlemen,—With your permission I will now offer a few more words on the Bingham *versus* Archer controversy, which I hope may be the last on a by no means pleasant subject.

When I wrote my former letter I stated *from memory* what I believed to be Bingham's collodion process, published in his work entitled *Photogenic Manipulation*, before Archer's name was heard of in connection with photography. I have now a copy of that work before me, and I find that my version of the process was not quite correct in some minor particulars. It turns out that Bingham's collodion process much more closely resembles that which we now use than I had supposed. His work was published in January, 1850, and therefore fourteen months before Archer published his celebrated article in the *Chemist*, in March, 1851, upon which is based his claim to the discovery of the collodion process. Bingham's collodion process is as follows:—Iodised collodion spread upon a glass plate; the film excited in a nitrate bath; the plate exposed at once, wet, in the camera; the image developed by a protosalt of iron; the negative fixed by hyposulphite of soda. Let me repeat—this was published fourteen months before Archer's process!

I will now give an extract from the work, which proves my assertion. The process is first described with isinglass as the vehicle for the chemicals; and we are then told that collodion may be used instead and answers moderately well:—

"Obtain some very clear and good isinglass, pour on it a little hot water, so as to produce a thick jelly; while still warm and fluid mix it with a few drops of a strong solution of the proto-iodide of iron; pour a little of this mixture over a piece of glass, and drain off the excess at one corner; allow this to get perfectly dry and hard, then suddenly immerse it in a solution of nitrate of silver containing 100 grains in two ounces of distilled water. It is now sensitive to the action of light, and should be at once placed in the camera. A very slight picture will, perhaps, only be visible; but it may be fully developed by putting it into a solution of the proto-acetate of iron containing a small excess of acetic acid. As soon as the picture is fully developed it should be rinsed in a little water and fixed by the hyposulphite of soda as in the preceding process.

"We may, in place of the gelatine (isinglass), employ a number of other substances to form an adherent film upon the glass. The following are a few of those we have experimented with and found to answer moderately well:—Vegetable gluten dissolved in acetic acid forms a very tenacious coating and difficult to remove. Collodion (gun-cotton dissolved in ether)," &c., &c.

And then he adds :—"The method of applying the solutions may be varied in a number of ways, and opens a wide field for experiment. When starch is used as a film upon the glass the iodine and bromine requisite for converting the nitrate of silver into the iodide or bromide may be advantageously applied in the state of vapour," &c.

The only point in which Bingham's collodion process of 1850 differs from that of today consists in his iodising his collodion with the iodide of iron instead of with the iodide of cadmium or ammonium. In Archer's collodion process of 1851 the collodion is iodised with iodide of potassium, and the image developed with pyrogallic acid instead of with a salt of iron.

I have now proved that Archer's collodion process was not a discovery, but only a slight modification of one which had been published fourteen months before, while the collodion process of the present day is an equal departure from them both. For what, then, are we indebted to Archer? That I will now endeavour to point out, for I feel that I did him some injustice in my former letter, if what I have since heard about him be correct.

He persevered with the process for several years, took some good pictures by it, and was very good-natured in demonstrating it to brother photographers. If it had not been for him the process might have been consigned to the limbo of many other good suggestions and have lain there until now. Bingham does not appear at first to have had much faith in it, for in the tenth edition of his work, published in 1853, he never praises it nor alludes in any way to Archer. He was a perfect master of the calotype, the daguerreotype, and the albumen processes, and, probably, found these sufficient for all his purposes. Many leading photographers—for instance, Claudet, Williams, and others of note—ignored the collodion process as long as they could and thought lightly of it at first.

With respect to what I said about Archer's optical attainments, I knew nothing but what had been published, and wrote accordingly. It has since transpired that he did things in optics which were not so foolish as I supposed.

On the whole, then, although I cannot regard Archer as the discoverer of the collodion process, yet I am now quite willing to honour him as one of the useful and intelligent pioneers of our art.—I am, yours, &c., THOMAS SUTTON, B.A.

*March* 5, 1875.

[We have merely to say, by way of append to Mr. Sutton's communication, that if he can see in Bingham's crude experiments with isinglass the discovery of Archer's collodion process we cannot wonder at the discovery made by another of our correspondents, namely, that Mr. Sutton himself is not entitled to any credit in connection with his "moist process," because Messrs. Crookes and Spiller, many years ago, tried to keep films moist by means of nitrate of zinc! As respects Mr. Sutton's statement concerning Archer's optical attainments, and that he wrote only according to what had been published, we must be permitted to say that, with one other exception, no one published anything detrimental to the claims made on behalf of Archer as an optician except our worthy correspondent himself. At this stage we think it would be wise and in good taste to allow the whole matter to now rest.—EDS.]

## MEDALS AT THE NEXT EXHIBITION.

*To the* EDITORS.

GENTLEMEN,—A rumour has reached me here, which I hope may prove an incorrect one. I am given to understand that the Council of the London Photographic Society intend to hold an exhibition this year, but to give no medals. Will you permit me, as one who has for years past contributed to exhibitions both at home and abroad, to express the opinion that this would be an unwise policy, and probably cause a serious loss to the Society and its exhibition.

Photographers have not the same prospect as painters at the art galleries of realising anything by the sale of their works. And the principal stimulus to an improved excellence in the photographic art is in the competition for a medal. What is really wanting is only the appointment of a jury possessing the full confidence of the Society and the public to distribute the medals, and no dispute need be feared.—I am, yours, &c., R. SLINGSBY.

*Lincoln, March* 6, 1875.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

REGISTRAIONS AND EXCHANGES.—In our next.

L. C.—Thanks. We had previously read the article, which we shall utilise shortly.

PROTO.—You may patent the tent if you feel inclined, but it is not a subject for securing by registration.

JAMES BRAGGE (Wellington, New Zealand).—Mr. E. Anderson's *Skylight and Dark Room* is out of print.

TECHNOS.—There is only one way in which over-printed proofs can be utilised, viz., by viewing them as transparencies.

M. A. J.—Do not depart in the slightest degree from the directions given; if you do failure will probably result.

REV. P. P.—Do not remove the flocculent matter by filtration, but dissolve it by the addition of hydrochloric acid.

PROFESSOR STEBBING.—Your portrait received with thanks. It has found a place in our album of esteemed friends.

W. W.—Mr. J. J. Atkinson's address is 37, Manchester-street, Liverpool. He will supply you with all that is required.

P. S. B.—The two methods of printing are not similar. The process of Tessie du Mothay is not only practicable but also excellent.

T. G. R.—The Dry-Plate Club does not now exist, otherwise we should have had much pleasure in proposing you as a member.

W.—The committee determined that they would not, for the present, either in an individual or collective capacity, express any opinion.

R. BRIDGART.—We find a slight difference between the lenses, but will indicate the cause and the remedy after a further examination.

EBONITE.—Scrub the inside of the bath by the aid of a tooth-brush the handle of which is extended to suit the requirements of length, and use with it a little nitric acid.

F. R. S.—The firm of Bolton and Co. has long ceased to exist, but there are other wholesale chemists from whom can be obtained what you term "out-of-the-way chemicals."

S. TOWNSEND.—The action of aceto-gelatine in the developer is of a twofold nature—it gives greater density to the image, and it causes the developer to flow over the surface with great smoothness.

A QUIZ.—The query you put to us—"What dry process do you purpose adopting during the forthcoming season?"—is quite legitimate, and we should willingly have answered it, but are not at present in a position to do so.

TYRO.—Let the gelatine be soaked in cold water for a few hours, then place the vessel containing it in warm water, or within the kitchen oven, when it will immediately become liquefied. Filter the solution through a piece of calico.

CONSTANT SUBSCRIBER.—1. The lens mentioned is well adapted for portraiture, but will prove rather unmanageable for your purpose unless it be used with a diaphragm.—2. Add a strong solution of common salt, and then wash the precipitated chloride of silver.

COUNTRY READER.—Let the sandarac be in proportion to the alcohol as one to ten, and to each ounce of varnish thus made add ten drops of castor oil. This will form a stock solution, which may be thinned by the addition of alcohol to any required strength.

S. M.—The group is very inartistically posed. The necessity for having the sitters arranged in a line would be avoided if a lens of a much larger focus were employed and the camera removed to a greater distance. This would allow of more latitude in posing the sitters.

REV. H. J. PALMER.—You will see in our leading article a reference to the graphogenic apparatus. We have never used it, and hence cannot say anything respecting the apparatus from our own experience. Directions for using it will be found at page 495 of our volume for 1871.

L. ARMSTRONG.—The sample of paper enclosed is what at one time was designated "porcelain paper." We are not aware whether it is at present prepared or not; it was introduced into this country by Mr. Anthony, of New York, several years ago. The surface is said to have been prepared with gelatine with which some white pigment had been mixed.

DUNDEE AMATEUR.—To test the value of the addition of nitric acid to the negative bath provide two small glass baths and fill both with silver solution from the same stock bottle. Now add to one of them strong nitric acid in definite quantities, taking a picture after each addition, and also taking one by the unacidulated bath at occasional intervals to serve for purposes of comparison. In this way, better than in any other, you will be able to satisfy yourself of the real value of an addition of acid to the nitrate bath.

R. TINDALL.—There is no doubt whatever that a final wash of gallic acid will confer great keeping properties on collodio-albumen plates. Without such a wash plates prepared by the formula you mention would not keep good for more than a week or ten days in a hot climate; but *with* a wash of this kind they may be depended on for several months. The usual strength of gallic acid is a three-grain or saturated solution. The emulsion by which Mr. Stillman took those views in America which we reviewed a few weeks ago possesses the qualities you desire.

RECEIVED.—G. W. Webster, F.C.S.; D. Winstanley; "Mark Oute."

PANORAMIC VIEWS OF THE LAKE DISTRICT.—We are favoured by Mr. William Ferguson, of Keswick, with three excellent little pantascopic views taken in the lake district. One of them—*Derwentwater, from Castle Hill*—is a view which under no circumstances could have been made pictorially presentable unless an exceedingly wide angle had been included; certainly the value of such a view would have been very much lessened were the included angle less than it is. For such scenes the pantascopic camera is simply invaluable. *Skiddaw*, with its surroundings, is also a charming picture.

CONTENTS.

# THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 776. Vol. XXII.—MARCH 19, 1875.


## PHOTOGRAPHY AND NEWSPAPER PRESS ILLUSTRATION.

Pending the publication of an illustrated daily newspaper—an event which is one of the "things talked of" in London—we purpose inquiring into the most appropriate means, in the present state of our knowledge, of preparing the illustrations for such a newspaper.

That from photography has been expected substantial aid in this direction we have the best means of knowing, having been more than once consulted as to the nature and extent of the aid it might be calculated to afford. The preparation of printing surfaces for the purposes of the illustration of daily newspapers may be divided into two parts, one being quite different from the other. The first of these—that in which ample time is permitted for the preparation of the printing-block—need scarcely come under our consideration, because, from the very limited time allowable, recourse may be had to any available method of engraving. The other—that in which illustrations must be got up on the spur of the moment, or certainly in the course of a very few hours—contains the whole gist of the matter.

No one possessing even a rudimentary acquaintance with the subject would for a moment dream of the possibility of an elaborate hand-cut surface-block being prepared under several days' close work; but what we contend for, and know to be within the reach of anyone or any firm possessed of capital and enterprise, is this—that any incident of which a photographic or other record exists may within a few hours' notice be handed over as a printing-block to be placed in connection with the type of the special daily paper in which is to be recorded the incident in question. For example: word is brought on the forenoon of a certain day to the office of a daily illustrated paper that Bishop Blank has had a fit of apoplexy which has terminated fatally; that H.R.H. the Duke of Anywhere has broken his neck in some field sport; that the Royal Exchange of London or the Custom House of Liverpool has been suddenly destroyed by fire; or that other casualities of a like and unexpected character have occurred. What we contend for is the fact that the various persons and scenes associated with the stirring events of the previous day may very easily be pictorially represented in an illustrated paper the day following that on which the events had taken place. No illustrated paper need possibly hope to keep up with the times unless it can do this.

The subject has during the past week been discussed before the Society of Arts; and with the assertion of Mr. Blackburn—who read the paper which evoked the discussion — that up to the present time wood engraving as a means of illustration is unrivalled we quite agree. But the absorption of time is so intimately associated with the production of a woodcut that this excellent method must be placed on one side for the present.

Given a drawing in clear and distinct lines, what is the quickest method of converting such drawing into a printing-block?

From a drawing of this kind a negative on any required scale can be produced in a quarter of an hour, and from that negative in half an hour more may be obtained a transfer in a varnish-ink which is capable of either being laid down upon a lithographic stone (a process of no use in the present inquiry) or upon a zinc plate ready to be etched down so as to produce a raised block for printing, or a gelatine relief which is capable of yielding a cast in metal that will print every line and dot in the original drawing. On this latter subject we speak with the confidence and certainty arising from our having close at hand *many* specimens produced in this way. But what we are concerned with at present is not the mere ability to reproduce a drawing in the form of a surface block, but of doing so under severe pressure as respects time; for we write from the point of view of an illustrated daily paper which has to chronicle, pictorially, the events of the preceding day.

One of the quickest reproductive processes extant is the following:—Have in stock a supply of glasses, or paper, thickly coated with bichromatised gelatine, prepared according to any of the numerous formulæ which we have published in this Journal. As these films are assumed to have been previously in stock, no time is lost in connection with their preparation at the critical moment. A plate of glass or sheet of paper thus prepared is placed in contact with the negative, exposed to the light for from ten to thirty minutes according to circumstances, and transferred from the solar printing-frame to a vessel of water. In two or three minutes the image stands in bold relief, and at this stage it is given over to the stereotyper, from whose hands, in an hour or two, it emanates in the guise of a beautiful metallic block, mounted upon wood and ready to be placed in connection with type by the printer. We have seen this done, and we have presented to our readers illustrations produced in this manner.

Another good process is to have slabs of gelatine containing a white pigment, upon which the artist makes his drawing with black ink containing any substance that will render gelatine insoluble. Bicromate of potash and chrome alum will readily suggest themselves as useful substances for this purpose. The surface upon which this drawing has been made is now treated with water, by which an impression in relief is immediately obtained, and upon which a cast may be taken in metal. It is doubtful, however, if the last-named method be better than, even if it be so good as, the graphotype process, which at one time was, and still may be, used for the production of printing surfaces.

In the foregoing remarks we have confined ourselves to the production of subjects that have been drawn in lines.

## ADVICE WITH REFERENCE TO THE WORK OF THE APPROACHING SUMMER.

As the days begin to lengthen and the light to improve amateurs naturally turn their attention to their favourite pursuit, and after brushing, perhaps, six months' dust from their cameras, and overhauling and emptying a large number of bottles, try to make up their minds as to the nature of the work to which they shall devote themselves.

The consequence is that, as usual, we have already received a number of letters, some containing suggestions, but many asking for advice as to the best dry process for those who have no time for experiment and even but little for actual practice. Some go a little further, and want to know whether during the somnolent season

anything in cameras or lenses has been introduced sufficiently important as improvements to warrant their adoption; while others sum up their wants by a request, as briefly as may be, to "put them up to" the easiest way of doing the greatest possible amount of good work.

Now, if it be kept in mind how fast on each others' heels follow the candidates for public favour, both in the shape of processes and apparatus, and how little, comparatively, in the way of experimenting can be done by one pair of hands, especially in the dull days of winter, it will be evident that the required advice is not always easily given.

Without, then, entering very minutely into what we think may really turn out to be the most perfect system for amateur work for the summer of 1875, we shall, as the result of the experience of many years, jot down a few hints, in the hope that they may be of some use to others beside those who have already written to us on the subject. We wish it, however, to be borne in mind that these notes are not intended for the amateur with leisure at his command—who practises photography as a pastime, and to whom we would say "try everything that is proposed or introduced and report the results for the benefit of your less fortunate brethren;" but they are meant for those whose occupation is such that they can with difficulty steal an occasional half holiday, and who, in consequence, are naturally anxious to make the most of that limited time in the production of good pictures rather than in the exposure of experimental plates.

First, then, as to the size of plate to be worked. There was a time when we preferred plates of the dimensions of twelve by ten inches to any others; but, although our camera of that size is to-day as good as when made sixteen years ago, and is certainly as light as any of that size constructed at the present period, there is no doubt that the carrying of the knapsack in which they are contained can hardly be considered "a labour of love," or, at least, is not a work of pleasure. Our advice, then, is to leave large sizes to the professional photographer, or to the amateur having sufficient leisure at command to prevent his ever being in a hurry—who, possessing adequate means, is enabled to lay the burden on the shoulders of another—and to adopt something like the convenient and presentable 8 × 5, or thereabouts. This is a size always attractive, and which can be manipulated at about a quarter of the cost of working the larger size—an object of no little importance to the class for whom we are now writing, especially when it is remembered that a large number of their prints are, as a rule, given away.

The form of the camera deserves some consideration. It should, of course, be as light as possible consistent with strength and durability. Whatever may be the form of camera selected, we would strongly urge the necessity for moderation in the notion as to the number of plates to be taken to the field. It cannot be too strongly impressed on amateurs—especially young amateurs—that one *good* negative is worth any number of bad ones, or even of only *pretty fair* specimens; and the more we see of the work of the inexperienced photographer the more thoroughly do we become convinced that, as a rule, three-fourths of the plates exposed by this class do not receive the amount of study absolutely necessary for the production of high-class pictures.

The young amateur with a dozen plates feels morally bound to "fire them all off"—a feat which, if each plate is to get full justice done to it in selection, light, shade, &c., is scarcely possible, especially if he be in the company, as he is likely to be, of a few congenial brethren of the camera. Four then, or at most half-a-dozen, is the utmost limit we would recommend, even for a long summer's day; and, if our experience be worth anything, the amateur who will so limit his ambition will, at the end of the season, have a much better account to give than he who cannot make up his mind to be content with fewer than three times that number.

And, lastly, as to the process. This is really the most difficult point of all. We have repeatedly tried almost everything in the shape of a dry, or even a moist, process that has been introduced, and may say we have got pretty good results with all. No doubt some of them are better than others; but we believe that, with few exceptions indeed, all that is required for their successful working is simply practice. Our advice, then, is to select whichever one may be considered most convenient and keep to it, studying it in all its moods until it is thoroughly mastered, and we are certain that whoever does so will not fail to secure good results. The essentials of success in a bath process are—a good dense film of bromo-iodide of silver from which the free nitrate of silver has been more or less thoroughly washed off; this is then coated with some organic matter—beer, tea, coffee, albumen, gelatine, tannin, or, in fact, almost any soluble organic material—and the film dried.

## CAMPING OUT.

In the work from which we quoted at page 98, in an article bearing the same title as the present—we allude to *A Painter's Camp*, by Mr. Hamerton—the author says:—"I may as well confess that, having tried camp life, I took a great liking to it, and to this day enjoy nothing so much, unless it be sailing."

We believe there are many professional photographers who would most gladly have resigned portraiture for landscape could the latter branch of the art have been made by any means to pay as well as the former. The taste for out-of-door occupation, travelling, gipsying, and roughing it, is peculiarly English, and there are few inhabitants of English towns who do not yearn for a country life. In some persons the gipsy blood runs so strong in their veins that nothing can stem it; and we could now mention the name of one photographer at least who has sacrificed what might have been a lucrative and, perhaps, a brilliant career in the studio to his detestation of town life and portraiture. Some amongst us have, no doubt, made landscape photography pay tolerably well—for instance, Messrs. England, Wilson, Bedford, Ferrier, &c., &c.; but the means which these enthusiasts adopted must have involved very serious travelling expenses, with an immense deal of fag and frequent disappointment. A work from one of them, under some such title as "The Adventures of a Landscape Photographer," would be a treat to us all, and highly instructive, if written in a simple, plain, and truthful style, without exaggeration or straining at effect; for the plain truth would be far more interesting than fiction, and quite funny enough in the main to keep the reader on the broad grin. Last year M. Camille Silvy promised us a narrative of this kind; but he has not yet published it, owing, presumably, to ill health, brought on, by his own account, by his too laborious practice of portraiture amidst the poisonous fumes of his dark room.

The question then arises whether that delightful branch of our art which so many sigh to follow but dare not—landscape photography—may not be made more practicable than it has hitherto been to ordinary mortals endowed with an ordinary share of health, strength, perseverance, and pecuniary means, so as to afford a fair remuneration combined with much enjoyment in its practice? And, again, whether by pursuing it on a totally different system from that which has been followed hitherto, much finer results and a greater variety of subjects may not be secured?

In our former article, entitled *Camping Out*, we have suggested that a landscape photographer should, in the first instance, select some fine locality where much good work may be done, and then make his "home upon wheels" and live in the midst of the scenery to be photographed for months at a stretch, including all seasons of the year. We have shown, we trust, that his van might be made to combine all the necessary comforts of a home and a dark room; and that, although it might be undesirable and unnecessary to drag it about to every spot whence a view was to be taken, yet that an ordinary tent, such as photographers use, or, better still, perhaps, a wheelbarrow-tent, might be made available for subjects within an easy walk of the van, which might, from time to time, be shifted to other stations by hiring a couple of horses for the occasion. In this way we have suggested that a landscape photographer, in company with an assistant, might pass a very pleasant time of it, spending but little more or, possibly, no more than he would do at home, and saving a vast deal of expense at inns and in the carriage of his paraphernalia, besides avoiding much risk of damage to it and to his negatives at the rough hands of porters, cabmen, &c. Add to this

the still more important consideration that, living always in the midst of the scenery to be photographed, and watching on the spot the various effects of light, &c., he would have a far better chance of doing good work than an ordinary tourist with his camera.

But there is a still better plan than a house upon wheels, to which we will now venture briefly to allude, as specially suitable for a travelling landscape photographer in certain parts of the continent, where much good work may be done—for instance, in Holland Belgium, and France; we mean a house upon the water—in other words, a photographic canal boat.

It is not our intention to do more at present than throw out this suggestion; but a very little consideration will convince anyone who is seriously inclined to turn his attention to taking photographs of the fine old buildings and beautiful scenery which may be found in the countries above named, that a suitable canal boat would be the most comfortable and least expensive mode of carrying out his idea. These countries are all intersected in every direction by canals, which pass many most interesting old towns and often wind about through lovely scenery.

The author from whose work we have already quoted made use of a double canoe for the purpose of painting the charming scenery of Loch Awe; but we must remember that no boat, however steady, would be steady enough to support the photographic camera whilst taking a view. A photographic boat could never be anything more than a home for the photographer, and a means of conveyance for himself and his paraphernalia.

Although we are aware of photographers having spent several days up the Thames, combining artistic and piscatorial pursuits, there are but few places in this kingdom where such an experiment could be conducted. Brittany, however, seems to offer great attractions for photographic excursions conducted in this way. It contains upwards of 500 miles of charming river scenery, where there is no current and no difficulty whatever in the navigation. It is, moreover, a province abounding in picturesque "bits," and even important subjects for the sketch-book and the camera; and its rivers have been as yet comparatively unexplored by artists and photographers. But the whole of France, from north to south and from east to west, is intersected by navigable rivers and canals, and hundreds of charming and valuable negatives might be taken along their banks in the mode we are now discussing.

It is quite worth while to think all this over. Although a great deal has been done already, and very beautifully, in landscape photography, yet, for the most part, silver prints only have been taken from the negatives, and large numbers of these have been damaged or altogether destroyed by that risky method of printing, at the same time that large numbers of prints have, no doubt, faded. If new negatives were taken for the Woodbury or collotype processes it would probably pay well for the trouble. For the latter of these processes the negatives should be taken reversed; whilst for the former it would be immaterial whether they were reversed or not. It should be remembered, however, that the Woodbury process does not deal very successfully with large areas of white sky.

In short, there is still an immense field open for landscape photographers, and those whose taste lies in that direction in preference to portraiture may do well to consider the plans which we have now suggested of making a travelling home of either a photographic van or canal boat in the midst of fine scenery.

## ENLARGING.

No. I.

Ten years ago the art of producing with success enlarged photographs on paper by artificial light and by development appears to have been entirely unknown. Advertisements, indeed, appeared in the journals at that period announcing that such work was undertaken and done by certain photographic houses; but from the prodigious amount of time which they required (especially in winter) to execute an order, and from the nature of the result obtained, it was manifest that, however sincere the desire to produce enlarged photographs by artificial light, there was a serious hitch somewhere in the details of the process then employed.* Indeed, the chemistry of enlarging by *solar* light and by development was then very imperfectly understood, no one, so far as I am aware, having succeeded in producing really presentable prints excepting the well-known Mr. Crowe, of Stirling. The use of artificial light, involving as it did and as it does a much more protracted period of exposure than that of solar light, brought with it a train of difficulties not experienced by those who relied upon the sun for purposes of enlarging.

In 1866, if I remember rightly, was inaugurated the first serious effort to carry on, commercially, the production of developed prints by artificial light. A firm in Manchester, doing business under a *nom de plume*, purchased an extensive and expensive set of apparatus wherewith to do enlarging for the trade by means of the electric light, produced by one of Wylde's ingenious machines for the conversion of mechanical force into dynamical electricity. The firm in question proved, at any rate, one thing—that they were the first to effectually substitute a light produced by artificial means for that irradiated by the sun for the purpose we are speaking of. Business rolled in in a surprising quantity, negatives were sent from almost every town throughout the kingdom, and the steam engine was frequently kept at work all night to enable the assistants to keep pace with the demand. The chemistry of the subject, however, remained imperfect, and the results obtained would bear no comparison with the developed prints of a later date.

In 1867 the writer of the present article attempted the solution of the question with the result of a process which it is now his purpose to describe, and which is at present extensively used by a number of small enlargers in his own and other towns. The process in question, looked at from the point of view adopted by men who have made no improvements in their lives, will probably have nothing in it. This however, can with truth be said of it—it gave with certainty results of an order not obtainable at all by any process published then, and not obtainable with certainty by any kindred process published now.

If the reader will adopt, I think I may say, *any* published formula for developed printing on paper salted with the bromo-iodides—at any rate if he will adopt the process recommended by Hardwich on page 507 of the seventh edition of his valuable work on *Photographic Chemistry*, and which process is as good as any I have seen published since—he will find the prints obtained characterised by a disagreeable, sunken-in appearance. This sunken-in appearance confers a greyness and lack of vigour, not unfrequently accompanied by fog upon the print when looked at by reflected light, and a prodigious and abnormal density upon the image when looked at by transmitted rays. If the reader will refer to a file of journals for the past ten years he will see this defect over and over again complained of, and remedies over and over again prescribed, the most favourite of these remedies being the extra sizing of the paper on which the picture is to be made. This remedy, however, is a very partial one indeed, its use being based upon a misconception of the cause whereon the sunken-in appearance takes its rise.

The true remedy for the defect in question is simple enough when known, though it does not occur to every one conversant with the chemical facts involved.† The remedy is simply this:—To iodise the silver nitrate bath to be employed to sensitise the salted paper. I do not exaggerate in saying that the knowledge of this simple remedy for so glaring a defect has been worth to me a sum of many hundred pounds. The *rationale* of the thing is this:—When an aqueous solution is poured upon a sheet of paper it permeates to some slight depth within its pores, and if that solution contain an iodide, of course, on drying, some portion of that iodide remains within the pores. On the application of the silver nitrate the argentic iodide is formed upon the surface of the paper and also in its pores. The argentic iodide, however, being soluble to a slight extent in the solution of the silver nitrate, some portion is dissolved, viz., the more accessible portion—that lying upon the surface of the paper used. The result is obvious: the latent image is formed upon the argentic iodide left within the pores, and hence upon development the image is formed within and not upon the surface of the paper used.

Without experiment the immense resulting difference can hardly be believed. Setting ordinary silver-printing prejudices on one

* This may have been the case in the north-western districts; but we know that in London, ten years ago, enlargements were produced in very considerable numbers by means of artificial light.—Eds.

† Mr. Winstanley appears not to be aware that in 1866—a year before he "attempted the solution of the question"—we had in an editorial article recognised the solvent action of the nitrate of silver on the iodide in the paper used for development printing; and, further, that in Bertsch's formula for producing enlargements on iodised paper, published the same year (1866), explicit directions were given with regard to the iodising of the silver bath by the addition of a "few drops of a saturated solution of iodide of ammonium." We refer to these facts by way of reply to Mr. Winstanley's statement that no remedy for the complaint to which he alludes could be found by reference to a file of the journals for the past ten years.—Eds.

side the fact remains that no developed print on paper salted with an iodide can possibly be good, and for the reasons named, unless the sensitising bath be saturated with the silver iodide.

D. Winstanley.

## DRY-PLATE PROCESS FOR SOLAR PHOTOGRAPHY.

[A communication to the London Photographic Society.]

Before commencing the preparation of the plates some fresh eggs (say four for a dozen medium-sized plates) are procured, and the whites carefully beaten up (with one drachm of liquid ammonia to each white) by a whisk, a bundle of quill pens, or by shaking in a bottle into which fragments of glass have been introduced. When the froth has subsided the clear fluid is procured by filtering through muslin, and is placed in a bottle labelled A. A glass of bitter or mild ale is next obtained, and to half of it (which should be five ounces) ten grains of pyrogallic acid are added, and the solution, if necessary, is filtered through filter-paper; this is lettered P. The other five ounces of beer are placed in another bottle, and labelled B.

Should the fresh eggs not be obtainable dried albumen may be used; twenty to twenty-five grains of the latter should be dissolved in an ounce of distilled water and substituted for them.

Bottled beer may also be substituted for the ordinary bitter ale. Care should be taken that, by a gentle heat, the carbonic acid is all liberated, otherwise carbonate of ammonia will be formed on the addition of alkaline albumen.

(i.) Any ordinary collodion will answer. The bromo-iodised sample supplied by Thomas, of Pall Mall, with two grains of pyroxyline added to each ounce, gives very rapid results.

For sun pictures, however, a modification is advisable; and much will depend on the climate in which it has to be employed.

(ii.) For a cold climate collodion made by the following formula will be found to give good results:—

| | |
|---|---|
| Thomas's bromised collodion | 20 ounces. |
| ,, ordinary bromo-iodised | 20 ,, |
| Plain collodion, *not* iodised | 6 ,, |
| Pyroxyline | 276 grains. |
| Water | 400 minims. |

(iii.) For warmer climates the following will answer better:—

| | |
|---|---|
| Thomas's bromised collodion | 20 ounces. |
| ,, bromo-iodised | 20 ,, |
| *Alcohol (sp. gr. ·850) | 6 to 8 ounces. |
| Pyroxyline | 300 grains. |
| Water | 120 minims. |

With i. the ordinary nitrate of silver bath, forty grains to the ounce, is used. If greater sensitiveness be required ten grains of nitrate of uranium to each fluid ounce of the above are added.

With ii. and iii. the above bath should be used, together with another made sixty grains to the ounce of water.

A substratum to the collodion is recommended, to ensure adhesion of the film to the glass plate during development. This is made by mixing the white of one egg with forty ounces of distilled water, and applying it to the surface of the plate by a piece of swan's down, calico, or flannel folded over the edge of a strip of glass and used as a brush. The brush is dipped in the fluid and drawn down the plate in parallel lines till the whole surface has received a coating. Here I may mention that a *clean* plate is necessary; but much polishing with a silk handkerchief or chamois leather prevents the substratum taking kindly to the glass.

Another substratum, which seems to give almost better results than the albumen, may be substituted for the above:—

| | |
|---|---|
| Sheet gelatine | 75 grains. |
| Distilled water | 60 ounces. |
| Ammonia | ¼ ounce. |
| Alcohol | 1 ,, |

The gelatine should be softened in thirty ounces of cold water, and then dissolved by thirty ounces of boiling water. When cold the remaining ingredients should be added.

If a plate (after the substratum has been thoroughly dried) be coated with collodion (i.) it is sensitised in the ordinary manner in the forty-grain bath, *i.e.*, for about four minutes in cold to two and a-half minutes in warm weather. If the plate have been coated with ii. or iii. it is plunged in the forty-grain bath and kept there till all greasiness has disappeared. It is then transferred to the sixty-grain bath and kept there for seven or eight minutes longer, *i.e.*, until a creamy film is obtained. The plate is next plunged into distilled water, or spring water which has been rendered slightly alkaline by adding a few drops of ammonia to it (if iron be present as an impurity), and to which, *after boiling and filtering*, a few drops of nitric acid have been added to restore neutrality. When the greasiness has disappeared from the film the plate may be washed under the tap for a minute, or in different dishes of water, until all free nitrate of silver is got rid of. (This may be effected rapidly by adding a pinch or two of common salt to the last washing water but one in the dishes.) In a small tumbler are next mixed equal quantities of A and B, stirred up with a glass rod, and floated over the washed film. If all the nitrate has not been washed away stains may here become manifest. This solution is kept on half-a-minute, and is then poured off. The plate is once more thoroughly washed, and solution P is floated over for another half-minute. The plate is then set up on one corner to dry spontaneously. Before being stored away the last trace of moisture may be expelled by gently warming over a stove or Bunsen burner. In dry climates this precaution need not be taken. As a rule, the plate requires no "backing" to prevent blurring of the image; but if it appear very transparent a backing may be necessary. Cartridge-paper stained with any red dye (alkaline aurine will answer) and coated with gum and flour stained of the same colour, will give what is required. When damped the paper will adhere to the back of the plate, and dry in optical contact with it. It can easily be removed by wetting.

* The hotter the climate, the more alcohol will be required.

The exposure is the same as that necessary for a wet plate prepared with the same collodion, though no damage will be done to the picture if six times that amount be given. With the uranium bath the dry plate is quicker than a wet plate.

The development need not take place for a month after exposure. The following solutions must be made up:—

| | | |
|---|---|---|
| No. I. | Pyrogallic acid | 12 grains. |
| | Water | 1 ounce. |
| No. II. | Liquor ammonia | 1 part. |
| | Water | 4 parts. |
| No. III. | Citric acid | 60 grains. |
| | Glacial acetic acid | 30 minims. |
| | Water | 1 ounce. |
| No. IV. | Nitrate of silver | 20 grains. |
| | Water | 1 ounce. |

The plate is washed in spring or rain water of a not lower temperature than 60° Fah. till all the beer has been removed. Sufficient of No. I. is taken to well cover the plate, and first flowed over it. Into the developing-cup are then dropped three drops of No. II., and No. I. is poured off the plate on to it. The solution is then flowed over the plate again, and after a few seconds the detail will begin to appear by *reflected* light. As detail appears another two drops of No. II. may be added, and so on till *nearly* all the detail is visible. The plate is now washed in water of the same temperature. Here it may be remarked that stronger doses of No. II. may be used to under-exposed pictures. Six drops of No. III. are next dropped into a clean developing-cup, and the same quantity of No. I. added as before. This is flowed over the plate to neutralise any trace of ammonia remaining. Into the cup are now dropped two drops of No. IV., the pyro. solution from the plate poured on to it, and once more applied to the film. The image will gradually acquire strength, the remaining detail appearing. The intensity is gained by adding to the same or fresh (*acid*) pyro. solution more silver (No. IV.). When the image appears of sufficient density it is fixed with a solution of hyposulphite of soda or cyanide of potassium. In the case where the plate is backed the film should be wetted first and then the paper removed.

The alkaline development produces a faint image by the reduction of the organic salt and bromide of silver to the suboxide of silver. The iodide is unattacked by it. The acid silver development utilises the exposed iodide thus—the attraction of the suboxide for fresh silver (deposited by the acid development) is increased by the irritated iodide, and thus density is acquired.

It will be noticed that no restrainer, such as bromide of potassium, is used with the alkaline development. The albumen dissolved by the ammonia plays the part of a retarder, but not of a destroyer. Thus the image is well under control.

An *under*-exposed picture has an image of slate-colour; an *over*-exposed picture has one of olive-green; whilst one properly exposed is of a rich chocolate-brown. Every plate sufficiently exposed will yield a good negative.

W. de W. Abney, *Capt.*

## ON THE USE OF PHOTOGRAPHIC AND CHEMICAL APPARATUS.

CHAP. X.—PREPARATION AND USE OF GASES.—(Continued from page 79.)

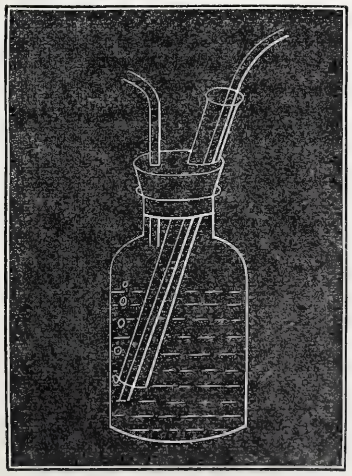
Frequent occasions arise for the use of gases in the form of solution, chlorine and sulphuretted hydrogen being very usefully prepared in

that state, and ammonia being rarely required in any other way. There are two principal methods of dissolving the gas. In one it is made to pass through water in a succession of bubbles contained in a series of bottles; in the other it is shaken up with the water in a bottle. This latter, or shaking process, which will be first described, is most useful in the case of the comparatively less soluble gases—chlorine and sulphuretted hydrogen—which dissolve in about half their volume of water, the latter being the more soluble of the two, while water will take up ammonia to the extent of six hundred times its bulk.

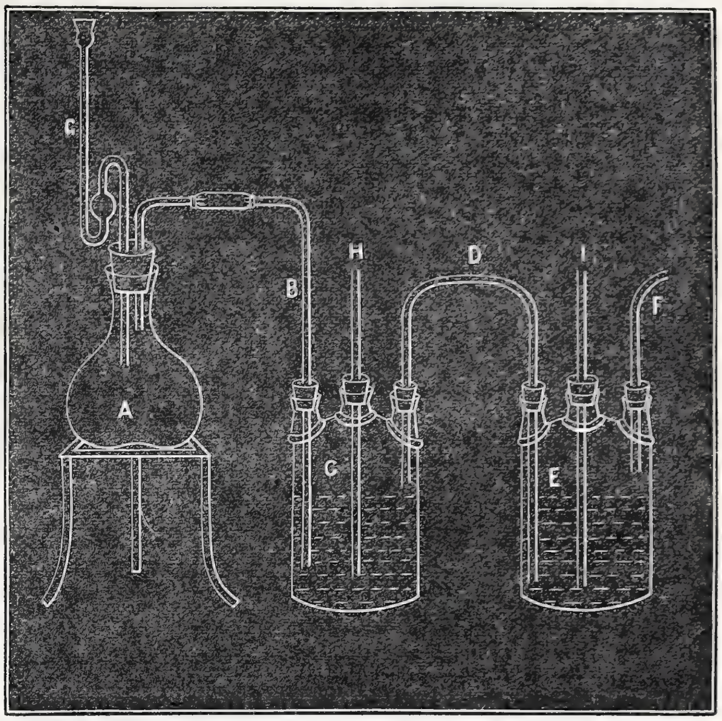
In making a solution of sulphuretted hydrogen two stoppered bottles should be provided, and about one-third filled with distilled water which has been recently boiled and allowed to cool. The gas, prepared as described, in a flask with a long delivery tube, is passed into one bottle till it entirely displaces the air. It is then to be directed into the second bottle, the stopper of the first put into its place, and the whole well shaken. The same operation is repeated with the second bottle, now full of gas, and an additional supply is introduced into the first bottle. The absorption of the gas by the water will produce a vacuum, which will be indicated, if the bottle be inverted, by bubbles of air passing up through the water when the stopper is partially withdrawn. A further quantity of gas must be passed into the bottle each time this test shows the absorption to be incomplete; when it is perfect no vacuum will occur, and the complete saturation of the liquid will be shown by air no longer passing up by the loosened stopper. The bottle during the process will be advantageously immersed in cold water, the absorption being best effected at a low temperature. At its conclusion the solution should be put into small bottles holding two or three ounces, made quite air-tight with sound corks, tied down with string, and kept in the dark, immersed, cork downwards, in a vessel of water.

Chlorine gas may be prepared and kept in solution in exactly the same manner as sulphuretted hydrogen, the precautions as to keeping the preparing bottles cool, and the store bottles away from light, being especially needful in its case—decomposition taking place in daylight easily, and in bright sunlight with great rapidity.

The method of obtaining saturation by means of a series of bottles is found useful in many special cases, and this chapter would be incomplete without a description of the mode of connecting a series of Woulff's bottles for the purpose; though for the mere procuring of saturated solutions of gas for ordinary testing work they are quite superfluous, for, as Mohr says, "for gases which are easily absorbed it is not required, and for gases which are not so easily absorbed it is inefficient, or, at least, is less efficient" than the shaking process. Moreover, while he gives a full description of the apparatus on one page, he goes so far as to call it a "philosophical toy" on another. A Woulff's bottle, either singly or in a series, may be very conveniently mounted by inserting a wide tube, open at each end, into one neck by means of a cork. Any gas delivery tube can then be instantly inserted or withdrawn through the wider tube without the necessity of going to the trouble of making fresh connections; and no fear of leakage need be entertained from excessive looseness of the fitting, for the gas will pass through the water outside the wide tube beyond its mouth. This arrangement can be carried out equally well with a wide-mouthed bottle with cork bored for the tubes; indeed, the cork has special advantages, inasmuch as the wide tube can be put in at a slant, and so all possible chance of the gas escaping through it be prevented. The sketch given will explain itself. It may here be noted that for all gas connections corks of the very best quality are required, the ordinary kind being quite useless from the constant occurrence of cracks and fissures. A cork, however, that would of itself be rejected may be made good by being soaked with melted paraffine.



The following diagram shows the manner of connecting the gas generating vessel and a series of Woulff's bottles. The gas is generated in A, passes through B, which dips to the bottom of the water in C, and, bubbling up through it into the space above, passes through D, and, in a similar manner, finds its way through E and F out at F. The number of bottles in the series is determined by the requirements of the process, so many as half-a-dozen being sometimes used. Let us now follow in some probable contingencies the action of the gas, which we will suppose to be one generated by the aid of heat from dry materials. The impurities mechanically carried over are arrested in C, a portion of the gas being dissolved and the purified residuum bubbling into E, where a further quantity is again




absorbed by the liquid, the remainder escaping into the air or the next bottle of the series. If the heat were withdrawn from the flask, and the evolution of gas in consequence stopped, a partial vacuum would soon be produced; if no provision were made the liquid in C would be drawn up through B into the flask, to its very great danger and the certainty of spoiling the results of the process. The safety-funnel G prevents this result. The lower bend is filled with water or mercury till it rises to about half-way in the bulb.

The external air will then, in the case of a vacuum being produced, force the mercury out of the first long limb into the bulbed one, and then pass through it in bubbles into the flask till the pressure of the air inside and out is equalised. If mercury be used the tube B, from its bend to the surface of the water it dips into, must be at least fourteen times the length of the column of mercury, measuring from the bend G to the surface of the mercury in the bulb.

Again: when the supply of gas ceased either through exhaustion of the materials in the flask or the withdrawal of heat the gas that remained, in the absence of a special arrangement, would be quickly dissolved, and vacuum in consequence produced. The liquid in C would then rise in B to supply the place of the dissolved gas, and, as before, enter the flask; while, simultaneously, the contents of E, by the pressure of the external air, which is, of course, the acting agent throughout, would be forced up to D to supply the place of the fluid which has left C. But the tubes H and I prevent all this disarrangement. As soon as the pressure in C and E is reduced the external air presses upon the surface of the liquid in the tubes, and, first forcing it out of the tubes, enters the vessel through the liquid till the pressure is equalised. It will thus be seen that when this apparatus is put together, and the evolution of gas once started, no further attention is required till the conclusion of the process—a point of considerable importance when the operation has to be continued for some hours. G. W. Webster, F.C.S.

## DR. SCHULTZ-SELLACK'S NEW BROMISED SILVER PAPER.

A few weeks ago we gave the substance of an article, by Dr. Julius Schnauss, on the treatment of albumenised paper, in which he held out hopes that, at no distant date, a better photographic paper than any yet in the market would be introduced. No one will deny that a better paper is greatly needed, and if the new paper come up to Dr. Schnauss's expectations we can confidently promise it a favourable reception; indeed, it is probable that, for some time at least, the demand will exceed the supply. Meanwhile, pending its appearance,

photographers must do the best they can with the old paper. To this end we would direct the attention of our readers to some remarks in the current number of the *Photographische Mittheilungen* on a new *bromised* silver bath, from which much is expected by its introducer.

Dr. Schultz-Sellack says that chloride of silver is, without exception, the substance most universally employed in photo-chemical processes. It is already nearly a quarter of a century since Talbot's experiments first called attention to the fact that paper impregnated with chloride of silver, and holding some free nitrate of silver, becomes darkened in colour when exposed to the action of light. Afterwards the rough paper surface was replaced by an albumenous, starchy, or collodion film, and the colouring became livelier, just as varnish makes the colours of a painting brighter. The next important improvement was the fumigation of the albumenised paper with ammonia; and since that it has been found unnecessary to retain the free nitrate of silver in sensitised paper impregnated with ammonia, and the sensitised film can be washed without injury to the capacity of intense colouring which the chloride of silver film receives by the absorption of ammonia. It is also known that nitrate of silver is sensitive when not accompanied by chloride of silver. In this case albumenised paper without any trace of salt is employed, the albumen being shaken up beforehand with carbonate of silver. With paper sensitised and fumigated in this manner the pictures sometimes turn out hard, and do not print deep enough. Paper so sensitised can be washed in clean water and yet retain its sensitiveness. One part of the nitrate of silver may, however, remain undissolved in the albumenous film, and will probably be dissolved in the hyphosulphite of soda bath.

It has always been Dr. Schultz-Sellack's impression that chloride of silver is the best medium for the silver process, but he has found that *it can be advantageously replaced by bromide of silver.* It is generally taken for granted that chloride of silver itself is more sensitive to light and colours more quickly than either bromide or iodide of silver. But let anyone prepare some albumenised paper with chloride, bromide, and iodide salt, all sensitised and fumigated in exactly the same way—on exposing them to the daylight he will find that the bromide of silver is by far the most sensitive of the three, taking on a very dark colour almost instantaneously, the iodide of silver only taking on a weak colour.

Under an ordinary negative the bromised silver paper takes a passable impression in a half or a third of the time required by the chloride. This greater sensitiveness to light of the bromised silver paper is also shown by artificial light; it gives passable impressions even by petroleum or gaslight when the ordinary chloride of silver paper shows no trace whatever of the exposure. This last circumstance originates in the difference between the sensitiveness of chloride and bromide of silver to the action of the colours of the spectrum.

The free nitrate of silver plays an important part in the bromised silvered paper. The sensitised bromised silver paper—which has, moreover, a clear yellowish film—cannot be washed before printing with impunity, as the chloride of silver can. The fumigation is also necessary to it. The bromide of silver tones in an alkaline gold bath, and takes, by preference, a purplish hue.

Nevertheless, the bromide of silver film never attains the same depth of colour as the chloride of silver, and when long exposed it loses the bright metallic colour of surface. Practically, then, better results will be obtained by using a mixture of bromide and chloride salts (two-third parts of chloride of sodium and one part of bromide of sodium), bringing the salt of the albumen into play. Paper prepared with this mixture shows a superior softness under hard negatives, and is susceptible of the most intense colouring.

Dr. Schultz-Sellack concludes by saying that he believes bromide of silver in combination with chloride of silver is destined to play as important a part in silver printing as it now plays in the negative process in combination with iodide of silver.

## ON PHOTOGRAPHIC STATUS.

[A communication to the South London Photographic Society.]

My name having been mentioned in a paper read by Mr. Hooper at the January meeting of the London Photographic Society, inferring that I was the first, or nearly so, who brought before the notice of photographers the subject of some distinctive mark being conferred upon them, probably a few remarks from me embodying my views at that time may not be out of place at the present moment.

In 1867, when I read before this Society my paper, *A Suggestion for Raising the Status of Photography*, I had arrived at the fact of the inability on the part of the public to properly distinguish between those who practised photography mechanically and those who brought cultivated taste and artistic feeling to bear upon it; hence I thought that some extraneous expression of opinion other than that of the photographer himself or the public would meet the difficulty. The idea I endeavoured to illustrate was this—that some properly-elected body should possess the power of determining the fitness of those who submitted themselves to such a tribunal, and also to grant some sort of certificate to such fitness. The immediate result of this, I thought, would be that those who did not consider it necessary to avail themselves of this examination must be content to be considered non-efficient, or, at all events, outside the ranks of qualified operators.

I advocated two degrees of merit—the one being, as I have just mentioned, universal in its application, attainable by all who evinced capabilities for photographic work, both in the matter of artistic taste and in chemical and optical knowledge; the amount of proficiency necessary to gain such certificate to be set forth from time to time by the duly-elected examining body. These photographers would be in position something like the medical profession, who obtain the title given by the College of Surgeons, or the ordinary chemists or druggists, who obtain certificates from the Apothecaries' Company or Pharmaceutical Society, without which any who appeals to the public for patronage would be considered a quack—in short, not a fit and proper person to undertake what he professed to do.

I then further advocated the possibility of a much higher grade of examination by a mixed tribunal of artists as well as photographers, to possess the power to grant some honourable title to such as had produced great results—the number of such to be limited; and this, consequently, would inspire emulation throughout all ranks of our profession.

I never for one moment entertained the idea that the simple payment of a subscription to any society should entitle the person doing so to any distinctive merit. My object was the gradual raising of professional status by having some defined standard of excellence in all branches established, so that every photographer could see how near to, or far from, the desired position of honour he might consider himself. How far the last seven years of the history of photography would have justified such an order of things, and whether the time is ripe for such an institution, may possibly now be made the subject of thought and discussion.

It will, I think, be granted by all who give any thought to the subject that, without interfering in any way with the liberty of any one person who thought fit to venture upon getting a living by entering our profession—at the same time photography having ceased to be a wonder and a marvel—its true friends must see the necessity of laying down some laws or rules for the future working of the same, and the introduction into its ranks of more properly-educated and, consequently, more qualified exponents than has hitherto been the case.

But the germ of what I have been suggesting, I think, already exists, inasmuch as the Photographers' Benevolent Association, just established, must in its working enforce some sort of qualification before it could with justice dispense any of its funds; so that we have only to build up a ladder, as it were, of gradual ascent to arrive at the pinnacle of what, I think, if once established, would prove to be as valuable an aid to the progress of photography as anything that has hitherto been done towards that object.

It must be admitted that, supposing such a tribunal had existed seven years ago, the necessary scale of qualifications must have been raised much higher at the present day, when we see the marvellous strides that photography has made in its pictorial element—by which I mean the active cultivation of latent artistic feeling, the daring attempts to regulate light and shade, and the greater attention given to the disposition of lines, involving the study of composition—showing that there has arisen a wonderful development of power, evincing design and thought.

All these results, I cannot but think, point to the fact that we have approached the time when such a matter as that I hinted at seven years ago may now be duly weighed and pondered over.

So far we have considered the advantages of some distinctive title in favour of the public or those who benefit by the advanced photographer; but something else remains which should receive the earnest attention of all who have felt the difficulties arising from the uncertain status, or want of actual defined social status, that of late has forced itself upon those who do not like to realise the possibility of being looked upon as one half shopkeeper, simply selling a manufactured article, whilst the other half exercises and cultivates some higher mental thought and power than is usually considered necessary for those who merely buy and sell.

I take it, then, that, at the moment, the impetus which this subject ought to receive must spring from the desire to raise and elevate the

author and composer of a pictorial production far above the mere disposal or supplying of the same, which really only should be supposed to exist as a secondary matter.

If, then, the cultivation of latent artistic tendencies and consequent higher phase of productions have brought about a desire to have some distinctive marks conferred, whereby the results of cultivated mental and elevating powers and taste for what is good, true, and beautiful should not only be distinguished from what is simply mechanical, but should meet with a reward both personal and social (which many would so deservedly be entitled to), nothing should stop the hearty co-operation of all those who by the power of their names can put the machinery into motion for such a consummation.

I do not take upon myself to make any practical suggestion relative to how all this might be done. I simply once more sound the key-note, so that all those who sympathise will respond and take up their parts. EDWIN COCKING.

## FOREIGN NOTES AND NEWS.

DR. VOGEL'S APPOINTMENT. — SHOULD THERE BE ALCOHOL IN THE DEVELOPER? — HERR HAUGK ON THE SUBSTITUTION OF GLACIAL ACETIC ACID FOR ALCOHOL. — HERR HAUGK ON "TEARS" IN SILVERED PAPER. — M. LIEBERT'S IMITATION IVORY MINIATURES.

DR. VOGEL, the editor of the *Photographischen Mittheilungen*, who is so well known by his researches with the spectroscope, has been chosen representative of German science in an expedition sent out to India by the Royal Society (London) to observe the eclipse of the sun.

The vexed question of alcohol or no alcohol in the developer seems to have occupied the attention of continental photographers very much of late. Amongst others, there is an article on this subject by Herr Haugk, in which he scouts Mr. Dallas's idea that the action of alcohol in the developer is injurious in the highest degree; that it retards the development, makes the pictures weak and insipid, and often occasions grey silver spots. Mr. Dallas's remedy for this state of matters is to leave out the *alcohol* altogether, and to substitute glacial *acetic acid* for it; and he says that one would be perfectly astonished at the brilliant and powerful negatives that result from this modification. Herr Haugk says he can prove this to be a fallacy; because, though glacial acetic acid, like alcohol, promotes the combination of the water and the collodion, yet one part of acetic acid to six of the developing fluid is sufficient. The proposed substitution may work well at first, but it loses its power and requires the addition of more glacial acetate, and soon the developer becomes so immoderately charged with the acetic acid as to be quite useless. The great quantity of glacial acetic acid retards the process of reduction. In a fresh developer this is not so observable, yet it does make itself felt, and it increases with age. If the quantity of acetic acid held in solution by the developer be excessive the latter acquires a reddish colour.

In support of these assertions Herr Haugk gives an account of his experiments with acetic acid and alcoholic developers. He mixed and allowed to stand for fourteen days two developers—one containing seven and a-half grammes of iron, 240 grammes of water, fifteen grammes of glacial acetic acid, and a like quantity of alcohol; the other containing, after Mr. Dallas's recipe, seven and a-half grammes of iron, 240 grammes of water, and forty-five grammes of glacial acetic acid, but no alcohol. For the first day or so both developers gave similar results, but after a lapse of about six days the second worked decidedly slower. The first still gave a good negative in eight seconds, while the second required at least three seconds more. The plates were kept the same time in the silver bath, the time between sensitising and development was the same in both cases, and on both ocassions the day was beautiful and the sky cloudless. These facts are all mentioned lest it should be thought that the cause of the more or less satisfactory formation of the bromide salt might be found in some difference of treatment. He concludes that the above-cited example of the effect of substituting acetic acid entirely for alcohol is not encouraging, and in point of cost it is still less so, as glacial acetic acid is as dear again as the best alcohol; and, further, there is nothing to fear from Mr. Dallas's array of evils if one only employ *clean* alcohol.

In a recent article on what he calls "tears," which now and then make their appearance in the drying of silvered paper, Mr. J. R. Tankersley says that they would disappear altogether if the silver bath were prepared wlth distilled water. Herr Haugk contends that Mr. Tankersley's proposed remedy is no radical cure, though it may act well in many cases, and especially when the albumenised paper has been previously spread out in sheets in a cellar and absorbed a little moisture, His method of treating the paper, to avoid these blemishes, is as follows:—When the paper has floated long enough on the silver bath he takes it up slowly, drawing it over the edge of the dish, and dries it between sheets of blotting-paper, taking care that this should be so done that, on looking across it, it may show a dull glazed surface totally free from those marble-like markings which sometimes originate in the silver bath. Should a paper so treated give some faint, spiritless impressions, then fumigate it with ammoniacal vapours for a few minutes before printing. The same blotting-paper may be used over and over again without injury to the paper to be dried.

In his work on *Photography in America*, which has recently appeared, M. Liebert gives an account of a way of colouring paper photographs so as to imitate well-executed ivory miniatures. The process, he says, is simple, and the pictures are remarkable for the freshness and purity of their colour. They most resemble carefully-finished ivory miniatures, and require much less labour than the ordinary run of water-colour portraits. To produce this desirable result we are instructed to proceed as follows:—Allow Steinbach paper to float for three minutes upon a bath containing—

| | |
|---|---|
| Filtered water ................................ | 1 litre. |
| White gelatine ................................ | 2½ grammes. |
| Iceland moss made into a paste with sugar | 10 ,, |
| Chloride of ammonia ........................ | 12 ,, |

Make a pencil mark on the corner of the wrong side of the paper so as to distinguish it. After it is dry this paper can be stored for a long time in a portfolio.

Silver this paper in a bath containing fifteen per cent. Print the picture with a vignetted background; tone, fix, and wash it in the usual manner. Take it out of the washing water and stretch it on a thin wooden frame without drying it. When it is perfectly dry colour it with water-colour. Lay the picture, still fixed in the frame, face downwards on a table heated by a lamp placed under it. Rub the wrong side of the picture with melted white wax, and remove the superfluous wax with a piece of flannel. Stretch a piece of straw-coloured drawing-paper upon a thin board, and fix the picture smoothly on the drawing-paper. Place the picture, paper, and board in a *passe-partout* with a gold-bordered matt, and the whole in a frame, when the operation will be complete. We fear that though these imitations may look pretty well at a distance they would not bear a very minute inspection.

## ART-CRITICISM.*

PHOTOGRAPHY.—If this long preamble have succeeded in indicating the abuse of details in art, the application to photography is self-evident. If the artist be tempted to pander to the prevalent taste of the day, and merge the central idea of his picture in an undue prominence of unnecessary details, the photographer is naturally still more strongly tempted in that direction, seeing he can render details with a minuteness and delicacy no artist can approach. In turning out his wonderful details, it is especially for him to remember that facility in working is not always felicity in work.

I have more than hinted that, as taste is the judgment arrived at by the endowment and balance of the artistic faculties in the individual, it generally exhibits itself in the community in modes that are far from giving one an idea of perfection; and I must add that the faculties which appreciate beauty and grandeur do not give general evidence of being greatly developed. No doubt multitudes have pleasant associations about the country in the abstract, connected with pastoral idylls, love in a cottage, and the like; but when they stand face to face with nature they feel no responsive thrill. The blue-domed temple is no temple to them. I shall give one example, and it is far from being exceptional.

Frequently, sailing on Loch Lomond in a steamer full of tourists, I have observed that not one in fifteen seemed to pay any attention to the magnificent scenery; they chatted, looked at their guide-books, and enjoyed the locomotion and the hill-air. In short, they were "doing" the fashionable in a healthy and pleasant manner; but they were not admiring nature. Yet these same people would look with delight on photographs of the scenes through which they were passing. The grand details of nature, blending with or relieving their magnitudes against the wide spread of shine and shade, were beyond their appreciation; but to see a tree or a rocky island put into three inches, with all the details of twigs and sparkling points brought out in a clear, startling distinctness—ah! that was worth looking at! And sometimes they would have the sense to say—"Photography is a wonderful art."

* Concluded from page 127.

The same sort of thing may be seen in Edinburgh any summer day, when Princes-street is crowded with tourists on their way to the Highlands. Few are the glances bestowed on the unique view of Castle and Old Town; many are the heads that gravitate in the other direction towards the shop windows, which, no doubt, are well worth looking at. It is from such as these, who have little or no feeling of the beauty and grandeur of nature, that the demand for photographs full to overflowing with a glare of endless details has sprung, and they who supply the demand are engaged in a laudable undertaking and have a fine field for their energies; but they need not think they are cultivating an art, or elevating the public taste.

Art does not consist in imitating, but in representing, nature—quite a different thing. The artist knows that he cannot imitate Nature without omitting her principal feature—the grandeur of her magnitude; and that to give all her details diminished to a petty scale would be a mere caricature, turning the grand giant into the semblance of a paltry dwarf. He considers how he can represent in a small size some feeling of the unattainable magnitude. How is the dwarfing canvas to give a gigantic effect? He must contrive that the leading features of a landscape shall stand boldly out from the minor or unnecessary details by enhancing the one and obscuring the other. Knowing the incompetence of art to give the *all* of Nature, his aim is to pronounce the leading idea of her grandeur. He throws a deep shadow on one part—not that the spectator may imagine something, but that the prominent feature may have its value enhanced by the mantling grandeur of shade, from which it rises; and he throws other variety of shades here and there, to give a feeling of softness, or refinement, or tenderness, as required by the theme. Thus, whilst he pronounces the idea of the scene by so merging its unnecessary details, he carries us beyond it into the bygone of our impressions connected with the feelings of grandeur or refinement or tenderness with which he has embued his picture. It is only by thus representing nature that a picture obtains breadth, force, simplicity, and repose, which are essential qualities of art.

The painter has an advantage in his brush that we have not in our nobler tool, the sunbeam, inasmuch as he commands his brush, while our tool commands us. But art binds all her votaries alike; they must aim at representation, not at imitation. When the photographer has well considered his landscape, and got it properly composed—his first great difficulty—he must study it under every aspect of light, and seize the moment when the shades fall most advantageously to enhance the leading features and merge the unnecessary details. He must remember that the success of his picture depends on its shades. Let him get the gradation of shades right and the lights will take care of themselves. The same rule applies in the studio. Brilliant details, when unnecessary, are the death of art.

*Texture.*—Texture is one of the essentials of fine art, and, like the other essentials, depends on an innate feeling. It cannot be acquired. It is in art what the *timbre* of the voice is in music; you may cultivate the voice, but you cannot change its *timbre.* Sir Joshua Reynolds advises artists when painting a face to think of the cheek of a peach. Texture gives the peachy softness, the life touch, the completing charm, which cannot otherwise be attained. Sir Joshua's own works show much of this charm, which is not so apparent in those of Sir Thomas Lawrence. That something equivalent in effect to this texture can be obtained in photography is evident when you compare smooth, hard photographs with others that have a feeling of life softness—the chief charm of photography. I believe that by using successive developers of different strengths, prolonging their action without addition of silver, a peculiarity of deposit is induced which gives the effect of texture. Texture is not an imitation of skin, but a representation of it. In Dutch heads we sometimes find an imitation of skin repulsively exact, more like an anatomical integument than a flesh consistency. The question is—How are we to keep the lens from producing such results in heads of three inches and upwards?

Mr. G. Croughton, in an interesting paper read before the South London Photographic Society, did me the honour of noticing some remarks of mine on the subject. He says—"In my experience it is entirely a matter of lighting and exposure;" and adds, "it may be obtained with any developer." Perhaps his remarks were intended to apply only to small-sized heads. I have always found the common style of developing in large-sized heads to be productive of anything but life softness, giving a mere imitation of the fibres of the skin. The larger the head the more pronounced must the texture be.

*Retouching.*—By "retouching" I mean painting lights on the negative, or "modelling." It almost seems presumption to speak against it; for no fashion has been more prevalent or more generally admired since the graceful crinoline went out of date. It has even been exalted into the "artistic touch" which gives brilliancy to a photograph; reminding one somewhat of the artistic touch a girl gives her cheek when she dresses in the highest height of fashion and becomes brilliantly vulgarised. It is but common humanity to sympathise with the next generation when they shall see the general run of the brilliant "retouches" of their fathers, looking as if the originals had been touched with leprosy. It is altogether a mistake.

Art is not to be juggled with. Trick and tinkering of every kind is alien to its nature. Every art is complete in itself—indebted to itself alone. What would you say of the painter who could not finish his picture without calling in extraneous aid, wholly apart from brush and pigments? You would say either that painting is an incomplete art—that is, no art at all—or that the painter was incompetent. In like dilemma the photographer who resorts to the brush casts a slur either on himself or photography. Either the one is not a true art or the other is not a true artist. Perhaps it may be said—"That certainly is true; yet retouching beautifies the photograph." To this I would reply in the words of the "Iron Duke," when George IV., who had come to believe that he led the charge at Waterloo, appealed at a dinner party to the Duke of Wellington if that were not the case, the Duke replied—"I have heard your Majesty say so before."

Photography, like every other art, must act solely by its own law, having its own idiosyncrasy or peculiar constitution, according to which it can render every suitable requirement of light and shade. It is difficult, no doubt; but difficulty is the boast of art and test of the artist. Photography should not imitate the effects of painting or chalk drawing. To imitate is to confess want of originality—the resource of incompetence. Photography, as different from other modes of representation, should be true to itself, and give its pictures wholly, according to its own idiosyncrasy, in a subdued tone of graduated lights and shades, in which alone its charm consists. It should work, so to speak, in a minor key. If a painting may be compared to the effects of a sunlit view, photography may rather be compared to the effects of a moonlit view. Take away from it this difference to other modes of representation, its subdued rendering, and you leave—what? Brilliancy, which, translated into the vulgar language, means "chalkiness."

I object, then, to retouching—1. Because by imitating the high lights of painting it departs from the idiosyncrasy of photography. 2. Because introducing a high light destroys the subdued effect of the graduated scale of shades peculiar to photography. 3. Because it destroys the texture, always producing, more or less, of a chalky or woolly effect. 4. Because it interferes with the likeness. If we could have a photograph of Shakespeare, would you wish it to be retouched? No. And why? Just because it would interfere with the likeness. Every man should be represented as what he is, and not what the retoucher thinks he should be, unless the man, aspiring to the *beau ideal,* is content to be turned out as an ideal beau.

But it may be said there are great authorities in favour of retouching. Great authorities are not always infallible, especially if from some peculiarity of taste, or wish to suit the public taste, they load their pictures with the flashy details of furniture and millinery, so that their pictures might almost be called an exhibition of the same, with a figure into the bargain.

But if the truth that photography, as an art, should rely on itself alone requires an authority, I name O. G. Rejlander. Requiring no adventitious aids, and scorning meretricious effects, he relied on his art alone; and, with admirable taste, his innumerable and widely-differing compositions are pervaded with the simplicity of excellence which ever characterises true genius. When the taste that rejoices in the brush has passed away he will be regarded as pre-eminently the first photographic artist of his day. If ever photographer stood on the higher platform he is the man. Latterly Rejlander never retouched.

These remarks are, of course, not intended to bear upon professional photographers, many of whom, I know, have to do what they dislike in order to please their customers. Trade, as well as art, has its prerogative—"Who live to please must please to live." But amateurs, at least, are freemen. We know that there are men among them of taste as well as skill; and it is for them especially—if they can forego the easy popularity that is acquired by a few dabs of the brush—to rely upon their art, and show the subdued style of beauty peculiar to photography, without which it has no pretence to be called an art. Already there are prophetic signs. I am told that in Germany a reaction is taking place, and that retouching is beginning to be regarded as a mere "dodge," unworthy of any man who has the capabilities of an artist.

*Life-size Heads.*—Mr. Crawshay has rendered great service in calling attention to the capabilities of the lens. Not having seen the pictures which gained his prizes, I can merely say that I believe the judges were conscientious in their verdict, and that the pictures are excellent, even making allowance for the touch of the fashionable brush. That life-size heads should be confined to the portrait painter I think can be proved by the fundamental principle of art. But, passing that, there are two difficulties in taking direct life-size heads. The one is that few skins can stand the near scrutiny of the lens without leaving on the negative many unseemly spots. Skins that show no freckles to the eye often do so to the lens. The other difficulty lies in the point of the nose. This very prominent feature is very apt to have, whether it be curved downwards or upwards, a prolongation at the point, as if nature intended humanity to be led by the nose, which it very often is. In most positions of the head this nasal knob perks itself unduly into the light, which, falling at a certain angle, becomes reflected or deflected with an amount of glare that causes exaggeration in the negative. For the same reason, though the hand be in perfect focus, the glaring fingers come out enlarged. This happens in small photographs also. Of course there will be distortion if the focus of the lens be too short for the occasion.

As somewhat in illustration I have laid before you three of the pictures I sent to the exhibition. As they were neither retouched nor touched they would, of course, look flat and dull beside those made brilliant with the "artistic touch." Since the exhibition the print of the large head has had the spots on cheek and forehead touched, giving it a more finished look. Several artists have seen it, and found the drawing correct, save a slight width at the nasal knob. They also agreed that it has a richness of effect not found in enlargements, which are, more or less, either chalky or flat. The two five-inch heads have not been touched. I have attempted in them to illustrate what I conceive to be the subdued tone proper to photography, wholly differing from the effects of painting and chalk drawing. The one is delicately lighted to show the texture of the face; the other shows the texture of the hands—a part that is apt to be defective in photographs. I asked the artists I have alluded to if the heads would be improved by heightening the lights. The reply was—"No!" Indeed every artist I have conversed with speaks of retouching with abhorrence.

In expressing opinions in a paper of this kind one is apt to appear to dogmatise. If I have done so it is partly owing to the fact that any artists I have had an opportunity of speaking with on the subject have substantially agreed with what has been advanced.

In conclusion: I am aware an opponent might say—"You have, for the most part, merely expressed opinions without meeting objections which might be brought against them." My reply would be—"I grant it, sir! One can't do everything in half-an-hour. I have merely tried to shunt you on to my line; and it will do you no harm to look at things from that point of view, and indulge in a little contemplation without partiality, and, if possible, without prejudice." W. Neilson.

## OUR CLUB.

### No. II.—Johnny MacFail's Lantern Entertainment.

"A speculation! Why everybody speculates nowadays; then why shouldn't I?" So soliloquised Johnny MacFail as he sat hugging his right leg, which was crossed over his left one, and gazing into the fire. "From the lad who bets one to five on the 'yellow' at the fair, up to the swell on the exchange who plays with the bulls and the bears—why, they are all dead on for a 'spec.' This little game of mine ought to do, for it has all the advantages that the working-man is continually crying for. It is instructive; it is moral; it is intellectual. Well! I'll give it a chance! Kilmarnock's the place to make a hit, and the expense of the whole affair can't be more than £10."

Eager for the fray he takes his hat and goes away to see Willie McPherson, a spirit dealer at the foot of the stair, who had told him that he was quite open to "stand" part of the expenses. To some of my readers the risking of £10 may not seem much of a speculation; but if you had only fifteen shillings a week to live on, and had to take the failure out of it if it proved one, you might think differently and pause awhile.

Johnny was simply a young hand in a chemical apparatus shop; but his soul was above his business, and he longed to give an entertainment. His *views* on the subject were that dissolving effects would prove a great success (if they did not begin first at his own pocket), and he thirsted to improve the masses and to amass a little wealth.

The crisis had come; so he went down to his friend, the spirit dealer, and observed—"Look here, Willie! I'm open for that lantern 'spec' now. You promised you would go halves." "Certainly, Johnny," McPherson replied, with a smile. "Its a sure success. I know the folks down there—a good house is a moral, lad." "All right," Johnny replied, with great glee—the spark of hope had kindled into a flame with the first breath of wind—"and if it's a success," he continued, "we'll be able to get a lantern for ourselves and travel the country;" and his face beamed with pleasure at the thought of being his own master.

Far into the night they sat making up the sensation bill, and as they parted Willie remarked—"We're in for it now, Johnny, so let's 'mak a spune or spile a horn.'"

The bills were printed, and Johnny asked away from the shop and went down to see that they were properly posted. After they were done he took a quiet walk round to see how they looked, and, coming upon one in a quiet corner where he was unobserved, he stood to gaze and admire. It was headed, in large type—"Professor MacFail will give his entirely new entertainment." He read over "Professor MacFail" three or four times, and he rolled it about his tongue as if it tasted sweet. He showed all his teeth; he was smiling so generously—to himself. There could not be a doubt about the newness of the entertainment, if the bill were any criterion. He proposed to start them at the land o' Burns, and travel on to the Holy Land. They were to meet Stanley on his journey through Africa, and refresh themselves by the clear, sparkling waters of the fountain (a gorgeous mechanical effect); they were to do the Overland Route in a quarter of an hour, and the Ashantees were to be quietly pounded to a jelly in the space of twenty minutes. Such wonders were there described in large green and red type that Johnny wondered why the crowds did not stand open-mouthed round each bill. "No matter, they will work their effect between now and next Saturday," he said to himself, as he turned on his heel and made for the train to town.

The "Professor" was all feverish excitement during the interval. Not a night that he lay down but he dreamed of it. He saw the crowds of faces from floor to ceiling of the Corn Exchange, and in his dreams he was happy. Saturday came, and the Professor's pulse was going at an awful rate. However, he got safely landed, had all his arrangements made, and was ready for the performance when the time for opening the doors came round.

Johnny was attending to his limes, and eagerly expecting every minute to hear the rush, when the money-taker put his head behind the sheet and quietly remarked, with a smile—"There's not a soul at the door, Professor." A shadow passed over the great man's face as he exclaimed—"After all this trouble is it to be a 'sell!'" A footstep was heard in the distance and the money-taker ran to get hold of the money.

The Professor waited and waited until the time was more than up. He was just about to put in his first slide when McPherson came behind the screen and said—"Twenty-six and threepence in the house, Johnny!"—when, with a jerk, the Professor sent the first slide into the lantern, and behold on the screen was seen *Good Night* upside down. The very slides seemed making fun of him; but the fact was he was so nervous that he had begun at the wrong end of his programme. "Twenty-six and threepence! Scarcely enough to damp the sheet!" continued McPherson, with a quiet laugh.

Johnny, pulling the slide with feverish irritation from the lantern, hastily exclaimed—"You go and stop the organ man from playing, Willie; that will save five shillings!" He had no sooner given expression to the thought than there resounded through the hall the organ pipes swelling out, and the tune was "Will ye no' Come Back Again?" Willie laughed, and Johnny could have torn his hair, but he had to keep faith with the public although it was a twenty-six shilling lot, and so he began his performance. He had brought a youth with him to do the singing, who, whilst wandering with Stanley in the wilds of Africa, warbled forth "*Why Left I My Hame?*" Had he known how he wounded the Professor's feelings he would have left it unsung.

Now and then a slide would not go in smoothly, but insisted on jumping up and down, as if the Professor was treating the masses to a show of fireworks; but, taking the exhibition altogether, it was very good—much too good to be wasted on empty benches.

Johnny and his company returned to town by the last train disgusted, and from that night speculation was *dropped* by the Professor as if it had been a hot iron. His dreams did not come true, and he has settled down to make up his loss out of his fifteen shillings a week.

When his friend Willie looks at him he remarks with a smile—"Thou hast no speculation in those eyes, Johnny." He moves on—not giving, but selling, retorts. Mark Oute.

# Meetings of Societies.

## SOUTH LONDON PHOTOGRAPHIC SOCIETY.

A meeting of this Society was held at the Rooms of the Society of Arts, on Thursday evening, the 11th instant,—the Rev. F. F. Statham, M.A., President, in the chair.

Mr. Vernon Heath was elected a member.

Mr. Edwin Cocking then read a paper *On Photographic Status* [see page 138], on which a desultory conversation took place.

The meeting was then adjourned.

## WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting of this Society was held on Monday evening, the 1st instant,—Mr. J. W. Gough, President, in the chair.

The minutes of the last meeting having been read and confirmed,

The Secretary laid on the table the February number of the *Philadelphia Photographer*, the photograph which accompanied it being inspected by the members with interest.

The conversation turning upon Mr. Howarth's stove,

Mr. Illingworth stated that since the reading of Mr. Howarth's paper he had had one of the stoves placed in his establishment, with the performance of which he was highly satisfied, the stove heating his gallery, reception room, and work room, keeping the former at a temperature of 50°, and the two latter at 60°.

Mr. Gunson confirmed the remarks of the previous speaker by stating that in his gallery one cold, frosty morning when he arrived he had found the temperature at 28°, and in one hour from the stove being lighted the thermometer, at a distance of five yards from the stove, registered 50°, and in the course of the day reached 60°.

Mr. Greaves (Halifax) then exhibited to the members the method of developing and transferring carbon prints, developing a number possessing great delicacy and beauty, some of them being fine examples of lighting and posing.

Mr. Smith (Halifax) was of opinion that the carbon process was not as yet likely to supersede silver printing, as he thought, owing to the dificulty in printing, it would require much more care than a silver print, which could be inspected during its progress.

Mr. Greaves replied that, so far as the difficulty in printing went, a man of good judgment in silver work could print equally well in carbon. All good printers classified their negatives, and nothing more was necessary in autotype printing. Having ascertained by the actinometer the requisite number of tints necessary to fully print any negative, by marking that number on the negative there could be no further difficulty, as that was a guide for every other print from that negative, one tint being a standard of intensity.

In reply to a question by Mr. Braithwaite (Leeds),

Mr. Greaves said that, in his opinion, an autotype print would bear rougher usage than an ordinary print upon albumenised paper; and that, although a certain matt surface was inseparable from the single transfer process, with the method of double transfer it was entirely optional with the operator whether he produced a matt or glazed surface. He might produce a print with a perfect enamel surface equal to the polished surface of the finest plate glass.

In reply to a further question by the same gentleman respecting the cost for small pictures,

Mr. Greaves further said that a photographer executing his *cartes* in autotype must raise his prices—he should think about twenty-five per cent. If he personally could devote his time to printing and developing the prints he should certainly prefer it to silver printing, as it was much more desirable to execute the prints in permanent colour; but under the present arrangement of business, in which that department had to be left to an assistant, it would probably not be so satisfactory, as the development required more judgment and care than the usual method of toning and fixing. Therefore, comparing results, a silver print unquestionably had the advantage in being more easy of production.

The Secretary inquired if in practice it was found necessary to make allowance for the continued action of the light after the tissue had been removed from the negative, supposing the prints were to be developed shortly afterwards.

Mr. Greaves said that in his practice he had found it advisable to allow a margin if the prints were to be kept for a few hours. If he purposed keeping them till next day he should print to about two-thirds the actual depth required.

Mr. W. E. Batho remarked that it was a disputed question whether the continuation was really due to the action of light or was a catalytic reaction set up in the sensitive gelatine film. If a piece of tissue were sensitised and carefully excluded from the action of light and put away for a short time it would be found to have become insoluble, and if it were developed a tint would be found over the whole surface.

The Secretary was of opinion that the question might be solved by printing on tissue from a negative sufficiently dense to preserve the whites, placing away for a while, and then developing. If the action were continued only where the lights had acted the whites would remain pure; but if the action were all over the film the whites would be proportionately sullied.

The thanks of the Society were unanimously accorded to Mr. Greaves for his interesting practical lecture.

A paper on the Woodbury process had been prepared by Mr. W. E. Batho; but, as the evening's proceedings would not admit of its being read, he kindly consented to enlarge it and read it at the next meeting of the Society.

This concluded the business, and the meeting was then adjourned.

# Correspondence.

## COLONEL STUART WORTLEY AND MR. M. CAREY LEA.

*To the* Editors.

Gentlemen,—As Mr. M. Carey Lea's letter, in your issue of last week, appears opposed to my late letter of gratitude to Colonel Stuart Wortley, I think I ought to convey my impression of it before I see or know anything of the Colonel's reply. I am always sorry to see these little jealousies of scientific competitors, and I really thought we had long ago settled the share which the two gentlemen now before us have had in the collodio-bromide process.

I perfectly well remember Colonel Wortley's communication of 1871, and the straightforward manner in which he mentioned all that Mr. Lea had done. My strong impression is that, whatever he had done before, Mr. Lea, so far from claiming then the advocacy of a large excess of silver, cried it down; tried to prove that it washed out in the water and preservative; and did not exist in the plate if it did in the emulsion.

But whether my recollection be correct or not, my concern at present is with my own assertion that I took up the process from Colonel Wortley's paper, in which I certainly regarded the large excess of silver (sixteen to twenty grains of silver to eight grains of bromide) as his specific invention. Now, I had carefully read the Journal years before. I may have—I think I must have—seen the paragraph referred to by Mr. Lea (in his letter of April, 1870), but I can assure you that I never should have considered his twenty grains as *adopted* by him, and still more certainly I should never have taken up the process from anything he had written upon it.

Mr. Lea wrote something then *in every number of your Journal*, and many a time have I taken it up and laid it down in bitter disappointment at finding in almost every number some different formula *as the last and best.* Who would say a man claimed the discovery of a process which he once tried, thought promising, but gave up for another which he strenuously maintained to be the only reliable one, writing strongly against his former convictions? Mr. Lea speaks of his twenty grains to eight grains with one preservative and his ten grains to eight grains with his vaunted and abandoned cochineal. Will general readers believe that the silver was diminished from twenty grains to ten on account of the "intense sensitiveness given by the cochineal preservative." I tried the cochineal once, but never again. Has any one since adopted it? If it really saved ten grains of silver to the ounce why alter it?

Then there was the *aqua regia*, for which Colonel Wortley gave Mr. Lea full credit, but which he and all good bromide plate makers, I imagine, have long changed for plain hydrochloric, as it rotted the film and gave thin negatives. Two drops of *aqua regia* with eight grains of bromide should certainly deprive ten grains of nitrate of silver of all excess. Yet how long and strenuously did Mr. Lea stand out for this?

How long will his present formulæ for chloriodo-bromide plates remain unaltered? I have not tried them yet, but I very strongly doubt their *practical* efficiency. His gum and albumen preservative alone would frighten me with the ghosts of infinite blisters; and the solution of twenty-four grains of nitrate of silver, which could not be made up in less than half-an-ounce of alcohol (·820), to which another drachm of alcohol is to be added with the cupric chloride, would scare me with fear of crapy films, whilst the emulsion must indeed be loaded if it is to contain twelve and a-half grains of salts and two drops of *aqua regia* saturated with twenty grains of nitrate!

I hope Mr. Lea will forgive me if in testifying as I did, and do, my debt to Colonel Wortley for the introduction of a clear, simple, practical advocacy of a large excess of silver in 1871 over what Mr. Lea was then advocating—which excess he had to maintain against a host of opponents, led on, if I recollect rightly, very much by Mr. Lea—I appear to undervalue the almost infinite experiments and recipes which his chemical knowledge and active inventive faculties have brought from time to time before your readers. I am very far from doing so, and I have always thought Colonel Wortley has been equally far from doing so. But what I must beg, with all deference, to assert is that the very multitude and variety of Mr. Lea's formulæ—not one of which has ever been permanently or commercially adopted, or long maintained even by himself—has always deterred me from attempting the bromide process, whilst I gladly look up and adhere firmly and confidently to Colonel Wortley's now well-known and established proportions. And I would fain assign any difference between them now—which I hope will soon die out, as it ought to do—to the two paths of theory and practice which I believe they severally prefer.—I am, yours, &c., St. Vincent Beechey.

*Hilgay Rectory, Downham, Norfolk, March* 15, 1875.

*To the* Editors.

Gentlemen,—A few words are, I think, necessary in answer to Mr. M. Carey Lea.

Mr. Lea vituperates me in no measured terms for taking his process. As you have now many readers who were probably not readers in 1871, I beg you to reprint the acknowledgment I made of Mr. Lea's services in my paper of June, 1871:—

"I may here, however, take the opportunity of pointing out how deeply indebted we all are to Mr. Carey Lea for the invesigations he has made into the conditions of this process, and for the liberal manner in which he has made public the results of his numerous experiments. I had never been able to work this process to my entire satisfaction (because my conditions are a collodion saturated with a free nitrate) till Mr. Carey Lea made the valuable suggestion of adding nitro-hydrochloric acid, brought to an orange colour by means of warmth, as an acidifier to the collodion. Good negatives are to be obtained by the use of hydrochloric acid only; but the mixed acids, as proposed by Mr. Carey Lea, are of the greatest advantage to the certain working of the process."

The point at issue is this:—Mr. Lea in 1870 used eighteen grains of silver, and in 1871 wrote that he "saw no use in loading the emulsion with more than ten grains of silver," and that "more than ten grains was not only useless but injudicious." Now all I say is that in this Mr. Lea grievously misled emulsion workers, and that the saturation of the collodion with silver was a necessity for the best work. Mr. Lea had never appreciated this necessity, and the fact of his having tried eighteen grains and then returned to and used only ten, and said clearly that nothing beyond that was of use, made his advice still more misleading. Mr. Lea fails entirely to see my point. It is no question of *excess* of silver, because, were it so, a good emulsion could be made with four grains of bromide of cadmium and ten grains of silver. But

it cannot, because it is a necessity for the collodion to be saturated in the first instance with silver, which, according to the strength of the solvents, it takes from sixteen to twenty grains to do. Mr. Lea's twenty-three or twenty-five grains only lead to waste, as no solvents fit to give a good film can dissolve that quantity.

It will not avail Mr. Lea to introduce the question of preservatives, because no possible preservative can exalt the sensitiveness of a ten-grain emulsion to the sensitiveness of a sixteen or eighteen-grain one; so that is where we differ as to making the emulsion, and in its development we differ equally widely.

Mr. Lea, in THE BRITISH JOURNAL OF PHOTOGRAPHY, lays down the law that "the use of carbonate of ammonia must be strictly limited to a maximum of about one grain and a-half to the ounce." I develope, and most good workers follow me, with *eighty* grains to the ounce, with an enormous gain in sensitiveness and quality of negative.

Mr. Lea is now introducing iodide into emulsions, as though it were a novelty and an idea of his own. In your issue of August 28, 1874, in my paper read before the British Association, he will find that *I* recommend iodide in an emulsion. I rate the knowledge of photographers higher than Mr. Lea does; for, as I found no difficulty in emulsifying iodide, I did not think it necessary to point out difficulties which do not exist. Iodide is quite easy to emulsify, though it may require even more than the two minutes' shaking prescribed by Mr. Lea.

It is most unfortunate that any one who, as I did, attempts to bring out improvements in a process should always be attacked for his pains; and those who have other interests and pursuits in life feel a temptation to abandon public writing on photographic matters, so as to keep out of the constant hot water into which the discontented and envious endeavour to plunge them. I conclude by saying that, unless any statement is made impugning my honour or good faith, I shall hold no discussion with Mr. Carey Lea on processes. It can only bore your readers, and my ground is firm enough to withstand his attacks.—I am, yours, &c., H. STUART WORTLEY.

*March* 15, 1875.

## NITRO-GLUCOSE.

*To the* EDITORS.

GENTLEMEN,—In the years 1865-6 I was conducting a course of experiments with nitro-glucose, having been led to do so from an article as to its uses in the process of printing-out enlargements by the aid of the solar camera, by Dr. van Monckhoven, Finding it difficult to procure I set to work to make it myself, and, like friend Noton, after repeated failures I succeeded. Dr. van Monckhoven's instructions were insufficient, as I believe I proved at the time. After making a few ounces, and finding it very difficult to eliminate the acids, I applied to Messrs. Hopkin and Williams for a sample, which they kindly supplied; and, having occasion to go to Newcastle, I saw the late Mr. John Mawson and his partner, Mr. Joseph W. Swan, to whom I detailed my experiences, and obtained from them a sample they had kept in a bottle for some years. On my return I tried all three samples, and had the gratification of finding my own manufacture the best of the three. Unforeseen circumstances stopped my experiments, and from that time to the present I have not resumed them, but I feel inclined to do so this year.

My object in addressing these few lines is that they may reach the eyes of Mr. W. B. Bolton, who contributed two able articles to your Journal on this product in August, 1874, and also those of Mr. Noton, who detailed his experiences before the Manchester Photographic Society last month, in order that both these gentlemen may favour me with a sample with full particulars as to its age and character. At some future time I shall have much pleasure in detailing my experiences with this substance.—I am, yours, &c., GEO. HOOPER.

68, *Canonbury Park South, N., March* 16, 1875.

## CHLORIODO-BROMIDE *VERSUS* KENNETT'S PELLICLE.

*To the* EDITORS.

GENTLEMEN,—With respect to Mr. M. Carey Lea's statement regarding the sensitiveness of my pellicle plates in comparison with his chloriodo-bromide emulsion, permit me to explain that it ought to have been the exposures of the *negatives*, instead of the *transparencies*, to which five to ten seconds had been given. I exhibited both negatives and transparencies, and in some way the report mixed the two together. The fact is that, instead of giving an exposure of from five to ten seconds to a gas flame to obtain a transparency, my trouble is to know how to expose short enough, and I only give the fraction of a second to obtain the best results.

I quite agree with Mr. Lea when he says it is but a rough way of making a comparison, as two gas flames may be quite unlike each other in their actinic force. It occurred to me we might approximate a much nearer balance of conditions by using a different light, and please do not laugh at the idea, for it is none other than a photograph by rushlight! I at once procured a rushlight and exposed one of my ordinary plates to this brilliant luminary for the space of one second. I now enclose you the result, also another exposed to the gas flame as quickly as I could possibly expose it—it may have been from one-third to one-half second. Now if Mr. Carey Lea will do as I have done—procure a rushlight and try his emulsion—we shall then stand on equal terms.

I would not for a moment insinuate that Mr. Lea made this statement with any desire to depreciate the sensitiveness of my pellicle or exalt that of his own, for he simply stated the matter as he found it printed. I wish I could attribute equal honesty of purpose to other writers in other photographic journals, by whom I and my process have been attacked with a virulence which would almost indicate the fear of the opposing parties, who cowardly fought behind a mask, that vested interests were by it in danger of being damaged.

I feel bound to take this notice of Mr. Lea's statement, as it would be likely to lead those who are using my pellicle and prepared plates into error and difficulties with the exposures.—I am, yours, &c.,

R. KENNETT.

[The transparency which was printed by the rushlight, as well as that by the gaslight, which is very fine and fully exposed, may be seen at our office.—EDS.]

CONUNDRUM.—What is the difference between photography and the whooping cough?—One makes *fac-similies* and the other *sick families*.—*Sun*.

SELECTING SUBJECTS FOR EXHIBITION.—Vendors of photographs in Paris and the principal French towns have been officially ordered to remove portraits of the Prince Imperial from their shop windows.

THE NEW "ALBA" PICTURE.—We have received from Mr. W. J. Stillman a charming picture printed, by some collodio-chloride process unknown to us at present, upon a white enamelled metallic tablet, and we have also received samples of similar tablets. They are prepared by the well-known Scovill Manufacturing Company, New York. Nothing can surpass the delicate purity of this picture, the surface of which is matt. The plate upon which it is produced has received the rather euphonious and appropriate name of "alba plates." They are thin and flexible, like ferrotype plates, the surface being a pure dead white instead of a glossy black. Plates of this kind ought to be invaluable for carbon printing, to which purpose we will apply the specimens we have received, and report again.

MEN OF THE DAY.—The London correspondent of a Liverpool daily newspaper says:—"A very large trade is being done in London with regard to the portraits of the American revivalists, and yet I am able to assure you positively of the fact that not one of these portraits has been authorised by Messrs. Moody and Sankey. Several eminent photographers in London have made Mr. Moody the most liberal offers for a copyright photograph, all of which, however, he has steadily declined, alleging that his object is not to make money by the exhibition of himself in any way. During the stay of the revivalists in Liverpool a well-known photographer offered Mr. Moody £1,000 for the right to take a photograph and to publish it exclusively afterwards. I may add that the photographs which are now being sold are merely copied from pictures which have been sketched of Messrs. Moody and Sankey under the most difficult circumstances sometimes, and that they are by no means flattering representations."

WANTED!—DISORGANISED SILVER BATHS.—We are aware that this want is a standing one with our friends the refiners; but in the present case it is connected with a purpose the very opposite to that by which they (the refiners) are governed. Mr. A. L. Henderson, of King William Street, believes that he has discovered an unfailing remedy for all the evils under the sun that can afflict a negative nitrate bath. He has cured all the bad baths upon which he has been able to lay hands, but would like a few more upon which to operate, so as to establish to his own satisfaction the fact of his new remedy being really a specific for such ills as a bath "is heir to." For this purpose he invites the co-operation of such photographers as have baths giving stains, pinholes, streaks, fogginess, and such other evils, and requests that they will send him such baths to be put into good working order *free of charge*. We advise those of our readers whose negative baths are not quite "up to the mark" to take advantage of Mr. Henderson's offer, which, reasonably, is not supposed to include baths which have been destroyed by having iron or hyposulphite of soda solutions poured into them.

PHOTOGRAPHIC COPYRIGHT.—On Tuesday last Charles Nerfert was charged, at Bow-street, on remand, before Mr. Vaughan, upon several summonses for selling and importing pirated photograph copies of engravings, the copyright of which belongs to Messrs. Henry Graves and Son. The case had been adjourned for the production of evidence as to the importation of the photographs, and now several letters to the prisoner from the well-known firm of photographers in Berlin, Messrs. Saal and Co., were read. These conclusively proved that the prisoner had been in the habit of importing these photographs for some time past. It also appeared that the prisoner was the agent who obtained the engraving, sent it to Berlin to be photographed, and then sold these copies in England.—Mr. Vaughan, in summing up the case, said that over £30 had been found upon the prisoner, and he thought if £25 of that money, together with the photographs found upon the prisoner's premises, were handed over to Messrs. Graves, that would meet the justice of the case. The £25

would be the accumulated penalty of £5 upon five different charges.—There was a second charge against the prisoner for selling and having in his possession for the purpose of sale a number of indecent photographs. This case was proved by Detective-Sergeant Sayers and Detective Butcher, and the prisoner was committed for trial.

## EXCHANGE COLUMN.



## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

Photographs Registered.—

R. Dighton, Cheltenham.—*Three Portraits of Mr. Frederick Archer.*
Robert Clennett, Hartlepool.—*Photograph, entitled "Wreck of the Francais."*

T. P. B.—Methylated spirits of wine will answer quite as well as pure alcohol.

J. Spall.—You will see that the subject has been alluded to by Mr. Kennett in another column.

Alpha. (1)—Caramel may be prepared by heating sugar. The temperature must be over 400° Fah.

H. G. Rogers (Capodimonte, Naples).—P. O. O. to hand, which pays your subscription to this date. Thanks.

Artist.—The longer-focussed of your half-plate lenses will produce a vignette portrait on a whole plate very nicely.

J. D. M.—Shake up some freshly-prepared oxide of silver in the nitrate solution. This will get rid of the acid and leave the solution in a slightly alkaline state.

G. Anderson.—None of the deposit complained of will take place if the negative receive a wash of a very weak solution of iodine previous to the application of the intensifier.

R. M. L.—We have no immediate intention of giving such a series of articles on photolithography as you desire. Quite enough has appeared in previous volumes to enable anyone to succeed.

J. W. Leigh.—1. Without having yet tried the process we believe that plates prepared by it will keep well both before and after exposure—2. We recommend the silver to be dissolved in the smallest quantity of water possible.

J. White.—The solution recommended was twenty grains of cyanide of potassium to the ounce of water, to which oxide of silver was to be added to saturation. After making this solution it is necessary to filter, and then add a little free cyanide.

E. Lockyer.—The plating of a steel roller with nickel is undoubtedly advantageous; but we are not in a position to institute a comparison between nickel and silver plating for this purpose. We know, however, that silver plate will tarnish rapidly, while nickel plate will not.

E. S.—We can account for the non-adhesion of the film only on the supposition that, either by long keeping or by the action of light, the whole of the film has become slightly insoluble. You are probably aware of the necessity for adopting what is termed the "safe edge;" in addition to this a marginal substratum may be useful.

A. Wright.—1. Make a solution of chloride of gold in the required quantity of water, immerse a small slip of litmus paper, which will immediately become red; then add, very little at a time, a weak solution of bicarbonate of soda until the reddened litmus paper becomes blue. The bath is then ready for use.—2. The Almanac for 1873 can be obtained from the publisher.

J. T. A.—In reply to an inquiry made by this correspondent in No. 774, Mr. Leigh says:—"I have used Winsor and Newton's moist water colours in collapsible tubes—usually the warm sepia. It is easier removed than Bates's black varnish, so that a slip of the pencil matters little. It takes easily either the varnished surface or the back of the negative, and does not crack in the sun.

W. H. T. (Preston).—The defect described seems to arise from your pouring on the developer at one particular spot, by which action the silver is washed away from that portion of the film, and which, in consequence, is left almost, or entirely, without an image. If this be really the case the remedy consists in pouring the developer gently along one edge and allowing it to flow evenly over the surface.

S. C. J.—The theory of the cause of the flare spot which you give is very ingenious, but not at all convincing. There is, however, one great flaw in your course of reasoning which brings to the ground the whole superstructure you have raised, viz., in its reflection from the inner surface *c* of the lens you have drawn the ray as passing in a straight line to *z*, whereas it ought, in reality, to undergo a very violent degree of refraction on emerging from the outer surface.

H. and Co.—If, instead of *grammes*, you substitute *grains* or *parts* you will not experience any difficulty in comprehending the formulæ.

A. Watkins.—1. Owing to the great sensitiveness of the gelatino-pellicle we imagine that it would be quite suitable for producing instantaneous pictures in the open air with a rapid portrait lens.—2. The lenses indicated by *a* and *c* are about equal in respect of rapidity and general utility; and on account of their greater rapidity we should prefer either of them to that indicated by *b*. The latter is, however, an excellent lens when the subject is such as not to demand a very short exposure.

Alpha. (2)—1. Both india-rubber and gutta-percha will dissolve in bisulphide of carbon with great facility; but the rubber must be of the light-coloured and unvulcanised kind—that which is known as "bottle rubber" is best.—2. The wax with which the wooden bath is to be coated must be *melted*, not dissolved.—3. The washed ether you have will answer very well for diluting the collodion.—4. "Cupric chloride" is merely chloride of copper. Ordinary *aqua regia* is meant.—5. The addition of the nitrate of barytes will not interfere with the neutralising and sunning of the bath.

Photo-Enameller.—Grüne's method of producing photo-enamels consists in making a transparency by the ordinary collodion process, and then immersing the picture in a suitable metallic solution until it is thoroughly toned. On the nature and composition of this toning solution depends the beauty and colour of the finished picture. For instance: chloride of iridium produces a black or, at anyrate, a very dark picture; a gold colour follows the use of chloride of gold; chloride of palladium produces a brown colour; while platinum and other metallic salts yield different tones. Of course the enamel must be placed in a muffle in order to have the image burnt in properly.

Lionel.—Our "Peripatetic" contributor desires us to acknowledge his receipt of a letter from "Lionel." He says that, apart from the fact that in his own case "Lionel" has been guilty of the discourtesy of withholding his real name, if that unknown writer's communications to the Editors be no clearer than that addressed to himself (the "Peripatetic Photographer"), it is not at all to be wondered at if the Editors failed to perceive his drift. We have merely to add that the anonymous correspondent in question received, as every correspondent does, fitting answers to whatever questions he may have put. In these days of clearly-written manuals we cannot in this page undertake to re-write disquisitions on topics that have previously been amply treated, more especially for the benefit of such anonymous correspondents as "Lionel."

Received.—Henry Rogers; E. W. Batho.

⁂ We are compelled to leave over till next week Capt. Abney's paper, read at the last meeting of the London Photographic Society, entitled *Photographic Operations in Egypt in Connection with the late Transit of Venus.*

Morley's New Price List.—We have received from Mr. William Morley his new price list of photographic lenses, cameras, and other apparatus. It contains, arranged in an admirable, classified form, a most comprehensive and useful list of choice apparatus. This *brochure* cannot fail to be useful to those who are in quest of such varied *matériel* as it is well known Mr. Morley supplies.

## GOOD FRIDAY.

Owing to our usual day of publication next week falling on Good Friday we shall go to press a day earlier than usual, and shall publish on Thursday the 25th instant. Advertisers and correspondents will please bear this in mind.

## METEOROLOGICAL REPORT,

*For two Weeks ending March* 17, 1875.

Observations taken at 406, Strand, by J. H. Steward, Optician.

These Observations are Taken at 8.30 a.m.

| March. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 4 | 29·99 | E | 34 | 35 | 42 | 33 | Dull |
| 5 | 29·99 | E | — | 32 | 46 | 31 | Dull |
| 6 | 29·77 | E | 38 | 40 | 52 | 31 | Dull |
| 8 | 30·01 | W | 52 | 53 | 58 | 51 | Dull |
| 9 | 29·85 | W | 50 | 53 | 56 | 51 | Cloudy |
| 10 | 30·42 | SE | 38 | 40 | — | 37 | Dull |
| 11 | 30·27 | E | 35 | 38 | 47 | 34 | Dull |
| 12 | 29·99 | E | 35 | 37 | 40 | 36 | Raining |
| 13 | 29·95 | E | 37 | 39 | 43 | 36 | Dull |
| 15 | 30·17 | NE | 33 | 34 | 50 | 32 | Dull |
| 16 | 30·21 | NW | 36 | 38 | 45 | 33 | Dull |
| 17 | 30·25 | NE | 36 | 38 | — | 37 | Dull |

## CONTENTS.

THE BRITISH
# JOURNAL OF PHOTOGRAPHY.

No. 777. Vol. XXII.—MARCH 26, 1875.

## TINTING PHOTOGRAPHS.

Of all methods of tinting photographs that which is effected by the employment of powder colours is the easiest. Daguerreotypes and glass positives were invariably tinted in that way. In the case of the latter we should, perhaps, make a certain reservation; for in some instances they were coloured in oil—a "process" with which we were at one time very familiar, and of which we may at no distant period give such practical details as to enable our readers to do likewise.

Powder colour, it is a well-ascertained fact, can be applied with immensely more ease and celerity than when the pigment assumes any other form. Let us suppose that the operating artist has a stock of these colours ranged before him. He dips his brush into the *flesh* colour and whisks it briskly over the face and hands of his subject; he then touches the shadows with a suitable shadow colour, the high lights with white modified to any desired extent, and the flesh is complete.

Powder colours, however, do not always adhere to the photograph; and hence a necessary preparation is to give to the surface of the plate or paper on which the photograph is printed a "tooth" that will admit of the powder colours easily adhering to it. At the period of collodion positives such a tooth was imparted by a varnish possessing a texture that caused a certain amount of the pulverulent pigment to be retained. A subsequent application of varnish frequently weakened to a very great extent the colorific powers of these pigments, because the atoms of colour were too feebly attached to the surface to prevent their being carried away by the flood of varnish with which they became incorporated. Without fixing, the atoms of colour lay on the surface liable to be swept away by any adverse wind passing across them; after fixing, many of these colorific atoms were found to have departed.

Mr. W. E. Debenham, of Regent-street—a photographer with whose name many of our readers are familiar—has conceived the idea that prints may be so prepared for receiving powder colours, and that these colours may be so attached to the prints, as to withstand any amount of ordinary wear and tear without being detached. Mr. Debenham's idea has fructified into a process or method, and this process is, in his estimation, sufficiently good to warrant him in investing the necessary amount required to obtain for his invention such protection (very frequently indefinite) as may be found in "Her Majesty's letters patent."

The nature of Mr. Debenham's improvements in colouring will be seen from the following abstract of his specification:—

A photograph being coloured with powder or crayon colour is immersed in, or floured over with, a solution of freshly-prepared, moist gluten in alcohol (the alcohol to be at a strength of about seventy or eighty per cent.), or a solution of gelatine, metagelatine, or kindred substances in water, with as much alcohol added as the solution will bear without precipitating the gelatine. If the solution be hot it will bear a large addition of alcohol. The important point evidently is that the solution shall be very alcoholic, to prevent the colours from "running," which they would do in an ordinary aqueous solution. This gelatinous coating may be rendered insoluble by treatment with tannin or chrome alum, the chrome alum being either added to the gelatine solution itself or applied separately, and afterwards exposed to light. *Why* this subsequent exposure to light is considered necessary we are unable to perceive; because a solution of gelatine is acted upon by tannin or chrome alum, and is rendered insoluble whether light be or be not admitted to the film. Be this as it may, the picture is prepared to receive the pigment by either of the alcoholic solutions mentioned, or by receiving a coating of glycerine or sugar, or a mixture of any of these; and this preparation liquid should contain at least fifty per cent. of alcohol in order that it may penetrate evenly. If the work can be coloured before being mounted, as in the case of a photograph to be enamelled, the patentee applies the preparation liquid to the back of the paper. The alcohol makes it penetrate to the front, and the colour is taken in a very even and fine manner.

The fixing solutions are also applicable to water colour, pencil, and crayon drawings. Mr. Debenham prefers to employ gluten solution as the fixing agent, and the picture will, he says, after this bear coating with an aqueous solution of gelatine, if desired, as an additional coat, or for the purpose of attaching it to the collodinised glass in enamelling. The fixing solution itself may also be used for this latter purpose and the colouring or "touching" not be disturbed.

When it is required that the gluten solution should contain more gluten than the alcohol will take up the patentee evaporates rapidly but not to precipitation, a portion of the solution and mixes with the remainder.

The definite claim is as follows:—"The use of an alcoholic solution of gelatinous substances for fixing drawings or colour substantially as described; the use of an alcoholic solution of gluten or glutenous substances for fixing drawings or colour substantially as described; the distinctive method of rendering the surface of a paper photograph adhesive to dry colour by the application of a liquid, as described, to the back of the print."

## ON THE VARIOUS FORMULÆ FOR SALTING COLLODION.

The subject which we propose to discuss in the present article is one of great practical importance to all classes of photographers, for the use of collodion has now become universal amongst them. Their common practice is to coat a plate with a collodion which has been salted with one or more of the soluble haloid salts, and to excite the film in a nitrate bath—the use of collodion emulsions being at present extremely limited. The best mode of salting a collodion for the purpose intended is, therefore, a question of very great practical importance in our art.

The haloid salts commonly used for salting collodion are the iodides and bromides of cadmium and ammonia, whilst a soluble chloride is occasionally, though rarely, used as an addition to an iodide or bromide. In discussing the best proportions in which these haloids should be used for special purposes we shall confine ourselves at first to the salts of cadmium, since the iodide, bromide, and chloride of cadmium are all sufficiently soluble in collodion, and yield the most permanent solutions at present known.

The three salts, iodide, bromide, and chloride of cadmium, may be used in any of the seven following ways, viz.:—The iodide, bromide, or chloride alone; a mixture of iodide and bromide, iodide and chloride, or bromide and chloride; and all three combined.

We will discuss each case separately, commencing with collodion iodised only with iodide of cadmium.

This solution is nearly, or quite, colourless and very stable. It does not quickly turn yellow by keeping, as collodion does which has been iodised with the iodide of ammonium, sodium, potassium, magnesium, calcium, lithium, or zinc; nor does the pyroxyline become quickly decomposed and rotten, so as to give slow films and bright, dense negatives which are strong in their contrasts, as is the

case with the other iodides above mentioned. We have now by us some collodion which was iodised with the cadmium iodide seven years ago, and its colour is only a very pale yellow, whilst it gives negatives of great beauty with an exposure only exceeding by about one-third that of freshly-iodised collodion, the film still retaining its toughness and good mechanical qualities. The chief and, we believe, the only rational objection to the very stable cadmium iodised collodion is that with some pyroxylines it gives what has been called a gelatinous or lumpy film; but this tendency is corrected by using a good and suitable cotton.

In the following comparative experiments we are about to describe, with collodions salted in different ways, the same pyroxyline was used, in the proportion which gave a film of good quality, and methylic ether and alcohol which had been purified by redistillation—the nitrate bath being made with neutral and recrystallised nitrate of silver.

With freshly-made cadmium-iodised collodion, and a nitrate bath thirty grains to the ounce slightly acidified with acetic acid, it was found that beautiful negatives could be obtained both with a pyrogallic and an iron developer, the latter bringing out the details with rather less exposure than the former. In neither case was any subsequent intensification required. The films seemed to be as sensitive as it is possible to make them in the wet process; but this great sensitiveness was only reached when the collodion was fully charged with the soluble iodide—say from six to seven grains per ounce. With a smaller dose than this there was a marked decrease of sensitiveness. It was necessary, also, in order to obtain the best results, to be very particular as to the right time of immersion in the bath. If this were too short the film was less creamy and less sensitive than it ought to be; while if it were too much prolonged insensitiveness and fog were the inevitable result. This important fact was established by so many conclusive experiments as to leave not a shadow of doubt in our own mind as to its truth. The explanation appears to be that as soon as all the soluble iodide is converted the mischievous iodo-nitrate begins to form in the film, which makes it less sensitive, and with a tendency to yield thin, grey, veiled negatives. In order to obtain the best results there must remain in the film, when it leaves the bath and is transferred to the dark slide, and even when it is developed, a trace of unconverted iodide of cadmium. The negatives which we have described as taken under the best conditions exhibited a fine, rich ruby-red colour in the sky and fully-exposed parts when the pyrogallic developer was used, with perfectly clear glass in the deepest shadows, and a fine surface bloom by reflected light. With the iron developer the lights still showed a warm tint, and not grey, and there was still a fine surface bloom, with perfect transparency in the deep shadows. In both cases the developer might be left upon the plate, mixed with the silver, for several minutes without producing fog, and until good printing density was obtained. With a new nitrate bath and the pyro. developer excessive over-exposure produced a pale-red, solarised sky, which, however, could be easily intensified, though at the expense of the rest of the picture, which then became too dense and overloaded with details.

On the whole, it appeared to us that, although a very high degree of sensitiveness can be reached with this collodion and the iron developer, the chemicals require to be in a state of extreme purity and efficiency, while the time of immersion in the bath and of exposure in the camera are elements of considerable nicety. We may show eventually that for these and other reasons photographers have done well to abandon this method of salting their collodion, except for some special purposes.

We come next to the case of collodion salted with bromide of cadmium only. Here it is found that, in order to get a creamy film which can be quickly excited, the nitrate bath must be more than doubled in strength and the quantity of bromide in the collodion raised to about twelve grains per ounce. Even when this has been done the bromide of silver is so slowly formed, in comparison with the iodide, that from five to ten minutes' immersion in the bath must be allowed, even in the summer season, instead of about three minutes when the iodide only is used. Moreover, when a creamy film has been obtained in this way it is still found that many *hours* of immersion will still be required in order to convert the *last*, or nearly the last, trace of bromide of cadmium in the collodion.

When the creamy and whitish film of bromide of silver, made as above described, is exposed in the camera with the free nitrate from the bath still clinging to it, and is developed either with the pyro. or iron developer, it is found to be rather less sensitive than the iodide film exposed and developed in a similar manner. The negatives are bright and dense, without requiring any subsequent intensification, but they are often badly afflicted with blurring by internal reflections. On the whole, therefore, this process seems to be of no practical value to the photographer. When bromide of silver is used alone the film must be washed and organified; it may then be developed either by pyrogallic acid and silver or by protosulphate of iron and silver, but a better way still is by the alkaline method. We have only to add that there seems to be much less tendency to solarisation in bromised than in iodised films. A very creamy bromide of silver film, made with twelve grains of bromide of cadmium in the collodion and eighty grains of nitrate of silver in the bath, and then washed and organified with albumen, would be suitable for copying engravings if a developer of pyrogallic acid and silver were employed, because absolute opacity in the blacks, combined with perfectly clear lights, can be obtained in this way if the plate be so much under-exposed as not to produce blurring.

When the collodion is salted with chloride of cadmium only, and the film is treated in the same way as we have described for bromide of cadmium, all we have said about the imperfections of the latter method becomes now greatly exaggerated. The bath must be raised in strength to more than one hundred grains per ounce, and a very long immersion of the film in it will even then be necessary; and when this has been done it will be found much less sensitive than the bromide film. This bears out what we all know to happen in the case of developed prints upon chloride papers. A chloride of silver film, exposed in presence of free nitrate and then developed by pyrogallic acid or protosulphate of iron, is *much* less sensitive than either an iodide or a bromide of silver film that is similarly treated. There is, consequently, no practical use in this process for ordinary purposes. Possibly at some future time the proper mode of developing a washed and organified chloride of silver film may be discovered, which may be an important step in our art; but that is a mere speculation at present, in which a few of us, perhaps, too hopefully indulge.

We wish it to be understood that in the experiments above described we have worked only with chemicals in the highest attainable degree of purity, and have kept the developer upon the plate until the image acquired full printing density, and that without the addition of silver. Unless these conditions are attended to results of a very different character will probably be obtained. But, above all things, we have been particular to exclude actinic rays from the dark room, and to consider no experiment trustworthy in which there was the slightest veil upon the transparent parts of the negative.

We have here discussed merely the three cases in which collodion is salted with only one of the haloid salts, the film being excited in a bath, exposed at once wet with the silver solution clinging to it, and developed either with pyrogallic acid or protosulphate of iron in the usual way, and reserve for another occasion the discussion of the remaining cases in which the salts are mixed in various ways.

## THE STATUS OF THE PROFESSIONAL PHOTOGRAPHER.

The status of the professional photographer is one of those perennial questions that recur from time to time, and which, after receiving a modicum of attention, in the shape of an expression of opinion from one or two of those most particularly conversant with the subject, is allowed to quietly die out, and the matter is left in *statu quo*. As might be expected from the fact that many minds have had their attention turned to the subject, numeroms schemes have been suggested by which the status of the profession as a whole might be raised, but, as yet, not one of the suggested plans has ever

taken practical shape. This is, perhaps, not much to be wondered at, the suggestions generally having taking a form that, seen from a different point of view, seemed hardly likely to secure the desired result.

Of all the schemes which have been from time to time suggested probably the one which has had the greatest number of supporters is that of the organisation of some institution, society, or association that should be empowered, after due examination, to grant something in the shape of a diploma which should be considered a guarantee that the holder had attained to a certain standard—forming a kind of "hall mark," in fact, by which the genuine article might be distinguished from the "Brummagem" imitation. We are aware that this project has been approved and advocated by some of our best men, and their opinions supported by what at first sight seemed rather good evidence, but which, on closer examination, is found, we fear, to want the ring of the true metal.

One of the principal arguments is drawn from the fact that the doctor and the chemist are not allowed to practise their callings until they have been subjected to such an examination as, in the opinion of the examiners, proves their fitness to be entrusted with the lives of the lieges. The same thing may also be said of those who practise the higher branches of the law—barristers, solicitors, advocates, and writers to Her Majesty's signet, all having to undergo a preliminary examination before they are entrusted with the unravelling of the tangled webs which generally form the staple subjects of litigation. Underlying such a comparison, however, there is, we think, a considerable amount of fallacy. Of both medicine and law the public may, as a whole, be considered rather ignorant, or, at least, to know so little that they are entitled to some protection from the schemes of designing, or the malpractices of ignorant, men; and, under these circumstances, it is clearly the duty of the state to step in and give that protection.

With art, however, or even with the general work of the photographer, it is a totally different thing. Here the public are, or are supposed to be, pretty good judges, having, at least, sufficient experience to understand the value of what they require in exchange for their money, and to be able to select, without any external aid, the men best suited for their purpose; and we think it is quite open to question whether an artificial title resulting from any kind of examination would have the slightest influence in the formation of their judgment.

Perhaps a more strictly applicable comparison might be found in the election of some of our best artists to the much-coveted distinction of member of the Royal Academy; but we are not aware that those who buy pictures, and by whom, consequently, the artists live, are ever influenced in their choice by the fact that the painter can write "R.A." or "A.R.S.A." after his name. It is undoubtedly true that there as good painters out of the academies as those who are in; and we feel pretty sure that if an order of merit amongst photographers were established tomorrow the same thing would be found to exist. But in saying this we do not by any means intend to imply that there is no necessity for improvement in the status of the professional photographer. Indeed, we do not hesitate to say that, in many cases at least, there is much room for such improvement; but we hardly think the proposed scheme likely to prove effectual.

There is, however, one method we have more faith in, which has been gradually gaining ground during the past few years, and which, when it has once become universally practised, will certainly have the desired effect. We mean the constant striving, on the part of all engaged in professional work, after perfection, or the approaching as near that desirable goal as may be in all their pictorial efforts. We believe that the general public are every day becoming more and more alive to what constitutes really artistic work, and that the time is not far distant when they who, through carelessness or incapacity, fail to reach a certain standard must retire from photographic art.

The outcome of the matter, then, is this—we believe that *one* sure way of raising the photographic status is for every photographer to look to his show-cases and specimens, to see that nothing finds a place there that is not as perfect as he can produce, and then to make it a law as unalterable as that of the Medes and Persians that no picture be allowed to leave his establishment which is not quite equal to the specimens by which his sitters were attracted. Possibly there may be some other way by which the desired end may be attained; but till that is discovered we strongly recommend the adoption of the one to which we have pointed.

## THE LATE THOMAS SUTTON, B.A.

The heading of this brief article will cause a thrill of emotion in the minds of those who, like ourselves, were in communication with Mr. Sutton up to the middle of last week. Mr. Thomas Sutton has gone from amongst us: his death was sudden. Only a few days have elapsed since he renewed a former pressing invitation to us to spend a few days with him during the forthcoming summer at Pwllheli, North Wales, where he had taken up his residence. This visit, he said, would afford both an ample opportunity for discussing such points in optics, photography, and even theology (for *we* know, although the photographic world may not, that Mr. Sutton felt strongly, and had written most energetically, on religious matters), as formed the subjects of several friendly letters which had recently passed between us.

As the older readers of photographic literature are aware Mr. Sutton was the originator and editor of *Photographic Notes*—a serial conducted by him while he was a resident in Jersey. Every reader of this Journal is familiar with the fact that he was, up to the autumn of last year, our French correspondent; while to a more limited number it has been known that he was so intimately associated with our weekly series of articles under the designation of *Foreign Notes and News*, more especially in connection with French topics, as to constitute him one of the regular staff of this Journal.

Personally, we have had in times past many *rencontres* with Mr. Sutton—many sharp and, probably, acrimonious passages at arms; but these may well be lost sight of in the many subsequent interchanges of friendly feeling that have passed between the deceased gentleman and ourselves.

What Mr. Sutton has done for our art-science we shall endeavour to show in our next monthly sketch of the men whose names, in connection with photography, are "familiar as household words." We shall then present a portrait engraved from one of the latest and best negatives taken of our departed friend.

Mr. Sutton was born September 22nd, 1819, at Kensington, London, was educated at a private school there, and in due time went to Caius College, Cambridge, where he took his degree in 1846 as twenty-seventh wrangler. In 1847 he became a resident of Jersey, and there commenced his photographic researches, of which we are preparing an account. In 1867 he removed to Redon, Brittany, where he pleasantly spent the intervening period till the end of last year, when he returned to England, or rather to Wales. Mr. Sutton had for some time been suffering from indigestion, but not to such an extent as to oblige him to be confined to bed until two days before his death, which occurred at half-past two o'clock on Friday afternoon last, on which day he was seized with cramp in the stomach, which, after a few hours, terminated fatally.

Those of our readers who had not the privilege of our deceased friend's personal acquaintance are scarcely in a position to form a conception of his true character. Judged merely by his articles in this Journal and elsewhere, he has been known for years as an able and fluent writer on many scientific subjects, principally in connection with optics and photography; but he was also possessed of social qualities which must call forth feelings of regret for his untimely decease. At home Mr. Sutton was ever surrounded by an atmosphere of *bonhomie* and genial friendship which secured the admiration of all who were admitted within the sphere of his domestic circle.

We reserve the details of Mr. Sutton's public photographic career until the publication of his biographical sketch, which, as we have intimated, will form the next in our regular series.

### THE CHLORIODO-BROMIDE PROCESS.

This process continues to give, in my hands, such results as to more than confirm the high opinion which I have expressed of it. Several

matters of which I intended to have spoken in my previous communication were omitted, and I send them now.

The density of the film and, still more, its fine yellow colour will probably render *backing* entirely unnecessary; for the strength of the colour is greatly more than in proportion to what the addition of such a portion of silver iodide would seem competent to cause. There is little doubt that silver iodide and silver bromide are able to form a definite compound. Dr. Schulz-Sellack states that this compound is *orange-coloured*—much darker than either of its constituents. The proportion of this compound which is formed in these plates gives them as much colour as could be reasonably desired, and completely changes their relation to such irregular manifestations of light as give rise to those blemishes known as "halation," "blurring," &c. Although it is, perhaps, still too soon to speak with entire positiveness, yet I am nearly certain that with these plates it will be practicable to omit the backing. So far, I have not applied the backing in a single case and I have seen no blurring. In a view taken a few days since—lens nine inch focus, stop about $\frac{f}{25}$ or smaller, twenty seconds' exposure—the objects projected against luminous white clouds were entirely free from blur; one would have supposed the plate, from its appearance, to have been perfectly backed.

I have always considered washing-off the backing to be the most disagreeable thing connected with dry-plate work, and the least carelessness will ruin a plate, which, perhaps, has been carried many miles, and exposed under circumstances not easily to be repeated. The putting of it on is also troublesome, and it requires care and attention to have the backing in such condition that it shall neither become soft in warm, damp weather, nor dusty in dry. In a word, backing is a recognised nuisance—hitherto a necessary one, but for the future, I hope, got rid of. For my own part, I never expect to make another dry plate without silver iodide; I look upon its use as a gain of great magnitude.

In my former communication I spoke of the chloriodo-bromide plates as being always black both on the surface and by transmitted light. Up to that time I had obtained only such; but since then I have had some developed with a grey surface colour and dark brownish-black by transmitted light. These plates support the use of bromide in development particularly well, and the directions already given on that head should be followed to get the best results.

I take this opportunity of referring to a mistake which I think is not unfrequently made with emulsion plates—that of having an insufficient quantity of the precipitated silver salts in the emulsion. It is true that a good and rich emulsion may be much diluted either with plain collodion or with ether and fair results obtained; but to get a rich variety of half-tones the film should be dense. Some specimens of pyroxyline permit this much better than others, and it is one advantage of a collodion that has been kept some time that it will carry more of the sensitive precipitate without becoming too thick for convenient use.

There has been lately much discussion as to the salts to be used in collodion, and cadmium bromide seems less in favour than formerly. The fact is that with either potassium or ammonium bromide collodion will ripen much more quickly and give density in perhaps one-fourth the time; but soon—for example, in a month—it begins to diminish in sensitiveness, whereas cadmium collodion goes on improving for many months, and is good at the end of a year (but not much longer in my experience). Therefore collodion wanted for immediate use may be advantageously made with ammonium salt.

Amongst other striking changes caused by the introduction of silver iodide into these plates is the increased power of resisting the hyposulphite solution. When I first brought forward the chloro-bromide process, in 1870, I strongly advised the use of a very weak fixing solution—one or two ounces to the gallon—because this solution sufficed to rapidly clear the plate, and with strong solutions there was a material loss in the intensity of the image. Before this it had been held by many that a bromide emulsion plate *must* be redeveloped with silver in order to enable the image to stand the fixing bath. The use of a weak fixing bath obviated this difficulty.

But now the introduction of silver iodide into the emulsion changes matters completely. A much stronger fixing bath is supported by the image, and is needed by the film in order to get the silver iodide completely out of it. The image does not seem to be visibly weakened by the use of a fixing bath as strong as that commonly used for wet plates. In saying this I am speaking of plates which have received their whole development by the alkaline treatment alone, by which they take any amount of density with the utmost ease. There is, in fact, only one case in which a redevelopment with silver may become desirable, and that is where the image has been burned up by excessive over-exposure and comes out flat and thin. As to "gathering density," about which so much has been said and published, it is only necessary to give a fair exposure, and, if the plate be left long enough in the alkaline developer, one may get high lights that look like heavily-smoked glass. Not that such results are desirable; but I wish to make it clear that with this process, using good materials and especially a good pyroxyline, it is *just as easy* to get too much density as too little.

M. Carey Lea.

## IS THE LIGHT'S ACTION CONTINUED IN THE DARK IN THE CASE OF CARBON PRINTING?

It often proves but a very thankless office to call into question what are termed "well-ascertained facts." Generally you are looked upon by an extensive class that I will term "blind followers" as an idiot, and often by those whom they follow as one wishing to gain notoriety at the expense of judgment. For the former class it is not wise to care anything, because their opinions are of that particular value fully represented by a cipher; for the latter body, feeling, as I often do, grateful for gifts of the fruit of their labour, I have hesitation in placing myself in a position that may be, and sometimes is, misjudged.

The "ascertained fact" it is now intended to question is that of the alleged continuation in the dark of the action of light in producing insolubility in a mixture of a bichromate with gelatine.

It will be as well just to run back and see what has been said on this matter. As to the date of the first promulgation of the idea I am not sure; but in the beginning of 1870 Mr. J. R. Johnson gave as a cause for the appearance of some carbon prints he was developing at the South London Photographic Society, and which proved to be apparently over-exposed, that, having lain by for some seven hours after exposure, they, owing to the said continuing action of light not having been allowed for, proved too dark. From thence up to the latter part of 1871 this certainly valuable property appears to have lain in abeyance, when Lieut. Abney practically reduced the exposure of his carbon tissue to one quarter, he then saying that with half the usual exposure eighteen hours in the dark was sufficient to bring the print up to the full vigour, and with twenty-four hours in the dark one quarter the ordinary exposure would be enough. Substantially, this is what has led to the belief that the light continues its action in the dark.

That sulphur does exist is a fact, but that it is distilled on to this earth from a certain place not polite to mention is questionable; and that a carbon print does increase in intensity in the dark after exposure may be true, but that it is directly a consequent of the light's action is likewise questionable, and in examining this matter it will be well to bear this in mind.

On a certain day a piece of the tissue supplied by the Autotype Company was sensitised on a bath of the usual strength and for the ordinary time, scrupulous care being taken to shield the tissue from the action of any light. It was sensitised at a temperature of 50° and dried at 65° to 70°, taking about two hours to dry. A negative was taken that was known to require two tints to give a fully-exposed print. However, to set the mind at rest, a picture was made, which may be called X, and which only received an exposure of one tint. It was developed at once, and then proved, as was anticipated, under-exposed.

When this was ascertained another piece of the same tissue, marked Y, was exposed for one tint under the same negative, and then was stowed away in a box from which light was perfectly excluded, and every precaution was taken not to set up the decomposition which results in insolubility; yet, at the same time, nothing was done that would destroy any tendency in that way which previously existed. There was also an unexposed piece of the same tissue, marked Z, placed in the box along with Y, but not in contact therewith. The whole were then left for twenty-four hours, when Z was exposed also for one tint under the same negative, and Y and Z were then developed together in water of the same temperature as that used for X. Upon comparing these prints one would learn first by examining X and Y if there were any intensity gained by the continued action of light in the dark; and, secondly, the comparison of Y with Z would enable one to determine whether such intensity (if any) was the result of the light's action, or the consequence of the insolubility known to take place in sensitised tissue by keeping.

However, in the experiments before detailed I could not perceive any difference worth mentioning in the three pictures produced. If there was any superiority Z had it, but it was so slight that you would hesitate before swearing thereto.

That there is some element introduced or eliminated in my experiments, when compared with those of Lieut. Abney, is plain, and it now becomes of some interest to find out wherein consists the difference. To assist in so doing it will not be labour lost if we first ascertain what will bring about insolubility in the gelatine and bichromate mixture.

In 1863 and 1864 Mr. J. W. Swan found experimentally that *moisture* had this tendency, and hence slow drying was objectionable. Quick drying "without the aid of extra heat" produced films readily soluble. *Heat* also had a like effect—in fact, "was as energetic a decomposer of the solution as light"—a reaction strengthened by moisture, and nearly suspended in its absence. *Age* likewise produced insolubility, a few days being sufficient for the purpose; and light was looked upon simply as an "*accelerator*" of this action, the chemical change involved in the reaction being the reduction of the chromic acid to a lower oxide, which oxide is the active agent in producing insolubility. Hence deoxidisers should be avoided, and, as might be reasoned from this, oxidisers would restore solubility—a valuable hint for reducing over-exposed prints.

And now for what I think may be the cause of the difference in result shown between the experiments here detailed and those recorded by Lieut. Abney. He says "the frames are taken into a warm, dry room and placed face downwards for the night." We have learned that *heat* along with moisture is a very energetic decomposer. The room, however, was dry; but no evidence is adduced to show that the tissue was in the same condition, and there is reason to believe that after printing it would be in a more or less moist state. Thus circumstances would be in existence for producing general insolubility, which *might* start from the already decomposed portion, something after the fashion a crystal is built up. But it is not for me to theorise now; suffice it to say that the said continuation of the light's action in the dark with carbon prints is wrong, and if such intensity be gained it is not directly the result of actinic action, which appears but to form a nucleus upon which some secondary agency builds. W. E. Batho.

P.S.—Since writing the foregoing I have been experimenting in the direction of producing insolubility in carbon tissue with other agents than that of light. While it has been pointed out that oxidisers would reduce over-exposed prints, I think I now call attention for the first time to the fact that deoxidisers have the contrary effect with prints under-exposed. From experiments I have hitherto performed I have the promise of being able so to control this power as to reduce the exposure in carbon printing very materially, and that without loss of time between exposure and development.—W. E. B.

## FOREIGN NOTES AND NEWS.

Dr. Vogel on the Substitution of Alcohol for Water in the Developer.—Dr. J. Schnauss on American Burnishing Machines.—Meeting of the Vienna Photographic Society.—The Application of Asphalte to Galvanised Prints.—Lichtdruck and the "Schnellpresse."—Kader's Albumenised Papers.—Should Aniline Colours be Used with Collodion?—Dr. van Monckhoven's Developer.—Collodion Varnish for Coloured Prints.—Fritz Haugk on Revarnishing.

Dr. Vogel recommends the use of alcohol in the developer instead of water. He says:—"The usual alkaline method of development is by using a *watery* solution of pyrogallic acid and ammonia (or carbonate of ammonia or caustic potash), with the addition of a little pure bromide salt. Before developing, in order to facilitate the action of the developer, it is usual to moisten the dry plate with alcohol, which is poured off and washed off. This washing causes a little trouble and delay, to avoid which I used an *alcoholic developer* instead of the *watery one*, as the former can be used without washing. I mixed ninety cubic cents. of alcohol, of 85° spirit, with ten cubic cents. of watery fluid ammonia, and added to this, on behalf of the developing, pyrogallic acid and bromide of potassium in the following proportions:—Eight cubic cents. of solution of ammonia in alcohol, 6.24 drops of pyrogallic acid solution (one part of pyro. to ten parts alcohol), two or three drops of bromide of potassium or bromide of ammonia solution (one part of bromide salt to 4 5 parts of water). The plate was moistened with alcohol of 75°, and not washed, but the developer poured over it immediately. The result was surprising, both in respect of clearness and equality. I work most with bromised plates, which are usually sensitised and washed in the silver bath. When the water developer was used there often resulted a lightness of film or else a number of spots were formed round the margin. It would be possible to avoid these blemishes by a careful personal preparation; but if the completion of the process be left to assistants a satisfactory result is seldom obtained. The poorness of the film may be amended by the addition of some bromide of potassium; but, as a rule, the want of the bromide of potassium is discovered too late—perhaps not until the picture is over-developed.

"This misfortune does not occur with the alcoholic developer, since the picture neither appears with the same rapidity nor intensity as with the aqueous solution, and is thus more under control. Moreover, with a shortly-exposed plate I have wholly left out the bromide of potassium, and, by employing *strong* alcohol, have obtained an absolutely faultless plate. If the alcohol used be very much diluted the developing is quick and acts more like the aqueous developer; but if the alcohol be very *strong* the picture appears slowly, owing to the retarding action of this chemical.

"The developer can easily be strengthened with from six to twenty-four drops of pyrogallic acid, eight cubic cents. of alcohol and ammonia without the addition of bromide of potassium. I have employed this alcoholic developer for the greater part of my recently-completed set of spectroscopic plates, and with the best results, even in cases where the aqueous solution had left me completely in the lurch. I ought to remark here that certain substances dissolved in the alcohol materially increase its power of retarding the development; amongst these are the aniline dyes, which I sometimes add to my dry plates. At first I used to pour the alcohol employed to moisten the plates back into the store bottle, and it was remarkable how plates, after being thus moistened, developed more and more slowly, through the absorption of these dye-stuffs by the alcohol. To avoid this I would advise the employment of perfectly clean alcohol. An especial advantage of the alcoholic developer is that with it the film sits close to the glass without the intervention of a first coating of albumen or caoutchouc, while with the watery developer the film has a great tendency to slip off in the washing and fixing. The different action of the watery and alcoholic developers is explained by the decrease of oxidation of the pyrogallic acid, caused by the presence of alcohol in the last-mentioned developer. It is known that the watery solution of pyrogallic acid becomes brown very quickly; that is to say, the pyrogallic acid soon becomes oxidised by absorbing the atmospheric oxygen. The alcoholic solution of pyrogallic acid, on the contrary, resists the action of the atmosphere for years before becoming brown—that is, oxidised.

"The presence of ammonia does not affect the alcoholic power of resisting the development; indeed, it increases in proportion to the quantity of alcohol, so that the rapidity of development is completely under the control of the operator. There is another reason why the addition of a bromide salt to the developer causes the alcoholic power to become excessive. The bromide of silver film always contains a small quantity of free nitrate of silver, which enhances its sensitiveness not inconsiderably. The watery ammoniac developer favours the solution of this free salt, and when that happens a cloudiness results; this is caused by the action of the pyrogallic acid on the ammonia, which immediately occasions an universal reduction of the easily-reduced nitrate of silver. The addition of bromide salt obviates this by immediately converting the nitrate of silver into bromide of silver, which is more difficult to reduce. Alcohol can in so far replace the bromide salt, since it only slightly dissolves the free nitrate of silver, and retards its quicker reduction, on the principle that *corpora non agunt nisi fluida*; therefore the bromide salt is far less necessary with a *strong* alcoholic developer than with a *weak* one. Aniline colours act similarly, retarding the alcohol when they are present in great quantity."

Dr. J. Schnauss says, *apropos* of the American burnishing machines, that they certainly give pictures a gloss hitherto unattainable except by the gelatine process. Yet he has often heard complaints of the difficulty beginners experience in using them with success, besides the danger of over-heating the picture, so that it is spoilt by brown spots, or rises from the cardboard, or becomes covered with small tears or cracks. He has lately received a bottle of tincture which professed to facilitate the burnishing, and the recipe for which was offered for a small sum. But Dr. Schnauss preferred to amuse himself by a chemical analysis of it, the result of which was as follows:—The colourless, somewhat milky, fluid deposits a sediment which should be shaken up before applying it. This application consists of rubbing the tincture well over the picture with a rag, and allowing it to dry before burnishing in the usual manner. On removing the stopper of the bottle Dr. Schnauss was sensible of a strong smell of alcohol, and distinct from that a smell of bitter almond oil. He poured the fluid into a glass, and after the elimination of the alcohol there remained a white, greasy, perfectly inodorous mass, which frothed up strongly when shaken up with water. The addition of a little salt or sulphuric acid brought a

scum to the surface of the fluid, where it finally deposited itself in white flakes. From this he argues that the tincture is nothing but a weak solution of soap in spirit of wine, the bitter almond oil only being added to disguise the soapy odour, and serving no other purpose. Whether or not this solution of soap in alcohol answers its purpose of facilitating burnishing Dr. Schnauss does not say. Having told how to prepare the secret tincture by warming and shaking up finely-minced soap in alcohol, with a little almond oil, he allows photographers to find out for themselves the value of the mixture. For the information of Dr. Schnauss we add that we have long ago published the formula thus "discovered," which we here repeat:—Dissolve one grain of castile soap in one ounce of alcohol and apply to the print by means of a sponge.

The Photographic Society of Vienna had a very lengthened sitting lately, at which a great variety of business was transacted. Amongst other things connected with the forthcoming Exhibition, the President announced that a medal had been awarded to Herr Carl Matzner, for his paper on *The Treatment in Printing of Enlargements upon Albumenised Paper.*

Herr Husnik laid a collection of photographically-treated plates before the Society. Some were for prints in relief, and others for copperplate prints. He also showed a number of impressions from these plates, amongst which were photographs and photozincographs. As to the process employed in the treatment of these plates Professor Husnik said that he used the Pretsch method of preparation with chromatised gelatine, but without the addition of iodide of silver, because with it, occasionally, an exposure for a whole day was required to obtain a favourable result. The treatment for the restoration of the necessary granulation to the half-tone required the addition of some chloride of calcium. The solution he has been accustomed to employ consists of twenty-four parts of Cologne glue (the sort labelled "No. 1"); four parts of bichromate of ammonium; 240 parts of water; seventy-two parts of spirits of wine; and in summer four, and in winter five, parts of chloride of calcium. The temperature of the workshop should be kept, both summer and winter, at about 20° R., this degree of heat being necessary to the formation of a skin upon the chromatised gelatine, which, in its turn, forms the granulated surface, owing to the crumbling action of the air upon it. With regard to the reproduction of linear pictures by the swelling up of the gelatine, it may be remarked that direct sunlight is absolutely necessary, and, in order that the strokes may appear sharp and of the dimensions of the original, the gelatine must be coloured. Neglect of this precaution is the cause of those reflections from the surface upon which the chromatised gelatine lies that interfere with the sharpness and cleanness of the strokes. Professor Husnik further remarked that the gelatine film should be thin; that when it is intended to treat the printing plate galvanically the larger white surfaces should be covered by a coat of thick asphalte before galvanising; and that before the application of the graphite a wash of colour should be laid by the roller over the other parts which should appear light.

Herren Römmler and Jonas, of Dresden, presented some excellent prints of considerable size, executed by command of the Queen of Saxony, which were good illustrations of the progress lately made in printing. They were printed by the lichtdruck process and by the new "Schnellpresse." Herren Römmler and Jonas say that this machine can throw off a print in seven seconds, and from 1,000 to 1,500 impressions in a day.

Dr. Hornig then exhibited some prints upon Kader's new albumenised papers—the "brilliant," the "double gloss," and the "imperial," as he calls them—to which we referred some weeks ago in these *Notes.* The President and all the members who had tried these papers spoke very favourably of them, especially of the "double gloss." The whole quire was useable, and was perfectly free from tears or blisters.

There was a long discussion upon the existence of a stable colour-medium for collodion that would replace indigo, aniline, and dragon's blood, in the course of which Herr Luckhardt remarked that, as far as his experience went, it was always necessary to employ coloured collodion with fuchsine. Herr Haak always found aniline red too changeable, and employed instead an emulsion of kaolin in raw collodion, which was always durable. Herr Luckhardt maintained that it was quite as advantageous to employ the collodion coloured with aniline, on account of the facility with which it might be applied, viz., by pouring; on account of the quick and easy removal of the film from the uncovered parts; and, lastly, on account of the adequate hardness of the covered places. In reply to a suggestion of Herr Fink's, that a thin coating of wax or gum of gamboge would be useful, he still insisted on the superiority of the aniline collodion, because of the difficulty of removing the superfluous wax and of cleaning the plates, and the imperfect action of the yellow-coloured parts, which did not take on a distinct impression. He then referred favourably to the method of coating the wrong side of the plates with a thick varnish, upon which chalk powder could easily be rubbed over the desired parts, and then the plates smoked over an oil flame.

In answer to the question—"What results have been obtained with Dr. van Monckhoven's new iron developer?" Herr Riewell said that he had obtained a good result with it on the 12th November under very unfavourable circumstances as regarded light. Several other members spoke favourably of it.

In answer to the question—"What varnish will give prints in colour the appearance of silver prints upon albumenised paper?" Dr. Szekely remarked that, to his knowledge, collodion with the addition of resin was used for that purpose in the studio of the court photographer, Herr Albert.

There was a good deal of local business transacted besides this, but nothing more of interest to the general reader.

Sometimes after a negative is varnished it is too dense or too thin, and the most rational mode of remedying this is to remove the varnish film, and then apply the necessary chemicals. According to Herr Fitz Haugk this can be most successfully and simply done as follows:—Pour alcohol three or four times over the negative so as to completely soften the varnish; then place the negative in a porcelain bath containing fluid ammonia, but do not let it lie there. Draw it up and down by hooks until the greasy streaks which show at first have completely disappeared; then wash the negative, and strengthen or weaken it as may be necessary. The strengthening can be done with iodide of pyrogallic acid or sublimate as preferred. The weakening can best be done with a solution of sublimate and cyanide of potassium. For the latter proceed thus:—First pour over the plate a weak solution of sublimate, about 1 : 20, and allow it to act until the picture surface has become a slate-grey colour; then rinse it thoroughly, and treat the surface with a strong solution of cyanide of potassium. If this has not sufficiently weakened the negative repeat the process fearlessly three or four times.

## ANDREW ROSS.

The subject of our present sketch, the founder of the eminent optical firm of Ross and Co., was of Scottish extraction, although born in London—an event which occurred in 1798. He was educated at Christ Church, or, as it is termed, the "Blue Coat," School; and, from the fact that he left school when he had only attained his fourteenth year, we infer that he must have been an assiduous student, otherwise he could not have acquired the sound mathematical education of which after years proved him to be the possessor. That Mr. Ross was a mathematician of a high order is abundantly evident both from his writings and his optical productions.

He left school to enter upon an apprenticeship with a mathematical instrument maker, and after fulfilling the usual term he served a sort of second apprenticeship in the establishment of a mechanical engineer. After labouring three years at practical engineering he became an *employé* in a business devoted to the manufacture of theodolites, levels, astronomical and similar high-class instruments. Among the works which Ross constructed while in this (Gilbert's) establishment was the astronomical circle which is now placed at the Cape of Good Hope, the dividing and execution of which was considered by Mr. Gilbert to be so satisfactory as to cause Ross's promotion to the post of conducting manager. From this it will be seen that, quite apart from other attainments, Mr. Ross was a skilled workman of the very highest order.

His career as an optician may be said to have really commenced from the period when a visit was paid to Gilbert's factory by Mr. Barlow. This gentleman had conceived the idea of improving and, at the same time, simplifying the construction of astronomical telescopes by making the object-glass of crown glass alone (in those days large discs of optical flint glass cost enormous amounts), and effecting a correction of the chromatic aberration which necessarily arose from a single lens. This was accomplished by interposing a small concave lens of flint, or of a dense fluid, in the path of the cone of rays transmitted through the object-glass. Mr. Barlow found in Andrew Ross the man of all others best qualified to aid him in carrying his ideas into practical shape, and from that time Ross began systematically to study the subject of the transmission of light through lenses.

Mr. Gilbert died, his effects were disposed of, and Mr. Ross, who had then become a married man with a family, commenced business on his own account. It was about this time that a furor arose for hydrogen lamps of an improved form, and which were greatly in demand, for this was previous to the introduction of lucifer matches. By the pressure of a lever on the top of a glass vessel for generating hydrogen a stream of this gas was emitted and projected against a bit of spongy platinum, which, becoming red hot, ignited the gas. Mr. Ross originated a large business in the construction of these novel lamps as well as in manufacturing mathematical scales. After this he removed to Regent-street, a few doors south of Piccadilly corner, where he opened a retail establishment for the sale of his various optical productions, among which were microscopic lenses made of gems of several kinds, including even the hardest, the manufacturing of these lenses being carried on in the rooms over the shop. This establishment was broken up, and he eventually removed to the premises in Featherstone-buildings, where he commenced the systematic manufacture of microscopes and telescopes.

He had at this period become a most able contributor to the literature of his profession. His clear and vigorous style may be seen by the article "Microscope" in the *Penny Cyclopædia*, written by him. Technical journals did not then exist in such profusion as they do at present; hence the majority of his professional communications were made through the medium of the Society of Arts, the volumes of whose *Journal* of about forty years ago bear testimony to the prolific character of his mental powers. Brief notices of some of these we here subjoin:—An elaborate communication on his improved method of dividing astronomical and mathematical instruments, extending over thirty pages of the *Transactions*, and for which he received the Gold Isis Medal and fifty guineas; a method of preparing polishing powder for the use of opticians; an exhibition and description of certain improvements in the achromatic object-glasses of microscopes, for which another Gold Isis Medal was awarded to him; two elaborate papers on the "Practical Illustrations of the Achromatic Telescope;" a description of his invention of the *spherometer*—an instrument by which the curvature of any lens or curved surface could be ascertained with great accuracy, and for which he received the large silver medal of the Society. A paper on the hygrobarometer, by him, is also to be found among the *Transactions* of the same Society. The jury-service medal of the Exhibition of 1851, as well as a Council medal for improvements in microscopes and for excellence of construction in his large equatorial telescope, were also awarded to him.

We have not been able to obtain correct information with respect to the precise period when he commenced the manufacture of photographic lenses; so far, however, as we can ascertain he was rather disinclined to go into this branch of optics. But his son Thomas—who was then associated with him in business, and who, like many other young men at the time, was fascinated by the Talbotype and daguerreotype processes, which had just then been introduced—managed to overcome his scruples, and (we quote from the *Journal of the Photographic Society*) "the father's sanction once obtained, the son immediately put all the vast appliances and resources of their establishment in operation, to aid the advancement of our delightfully-fascinating, beautiful, and useful art."

Mr. J. Solomon, of Red Lion-square, who knew Mr. Andrew Ross somewhat intimately, relates an incident of an amusing kind in connection with the freemasonry existing between men of genius. Mr. Solomon—who, we may state, was at that time well known as an enterprising commercial optician in France as well as in London—received a visit from M. Buron, of Paris, who was then one of the principal manufacturers, if not the only continental maker, of lenses for the daguerreotype. He desired to be introduced to Ross, of whose fame as a microscope lens maker he had become well aware. Accordingly M. Buron, accompanied by Mr. Solomon, called on Mr. Ross. A certain degree of stiffness and formality characterised their intercourse, which, necessarily, was carried on through Mr. Solomon; for M. Buron unfortunately could not speak English, and Mr. Ross was quite as much "at sea" with regard to speaking French. M. Buron, after a short time, seized a sheet of paper and drew upon it a mathematical diagram, directing Mr. Ross's attention to what he was doing. Ross instantly replied by drawing another diagram; and this curious dialogue appears to have been so satisfactory to both men that they instantly shook hands with that cordiality which usually accompanies the meeting of old and dear friends. It would have been interesting had this unique "conversation" been handed down to us, but it appears to have been destroyed at the time. This interview took place some time previous to 1851, in which year, at the Great Exhibition, Ross exhibited his portrait lenses constructed on the Petzval principle, and the report of the jury on which instrument at once established his reputation.

THE LATE ANDREW ROSS.

Mr. Ross had ten years previously constructed lenses for portraiture, one of the earliest of which—that made for Mr. Henry Collen in 1841—we have frequently seen and examined, and a diagram and description of which was given in our articles on *Photographic Lenses* in The British Journal Photographic Almanac for 1870 (page 44). This, so far as can be ascertained, was the very first cemented, and *compound*, portrait lens ever made. When Petzval had published his researches, and the Voigtlander portrait lens had been introduced, Ross at once saw the value of Petzval's modification, and thenceforward adopted it as the basis upon which all his portrait lenses were subsequently constructed. Of the quality of these lenses it is unnecessary here to speak. The name of Ross upon any optical production stamps it as one that cannot be surpassed on the score of excellence.

After having laid the foundation of a large and important business Mr. Andrew Ross was "gathered to his fathers" at the age of sixty-one. At a period when he was busiest in his favourite pursuits he was called suddenly away from his family and a numerous circle of loving friends.

"The farthest from the fear
Are often the nearest to the stroke of fate."

He was found dead in bed on the 8th of September, 1859. Few of the present generation were personally acquainted with the subject of this brief memoir; but those who were so favoured still retain many pleasant memories of their intercourse with the famous optician.

As his son, Mr. Thomas Ross, was "a chip of the old block," had received a mathematical education, and had acquired practical experience in the workshop, no change took place in the force and efficiency with which the business was conducted, and which at the present time is carried on energetically in all its various departments at 7, Wigmore-street, to which it was removed a few years back, when the premises at Featherstone-buildings were found too small to allow of such an expansion of the establishment as had then become necessary.

Our portrait is engraved from a photograph in the possession of the family, and which is said to be an admirable likeness.

## ON THE USE OF PHOTOGRAPHIC AND CHEMICAL APPARATUS.

CHAP. X.—PREPARATION AND USE OF GASES.—(Concluded from page 137.)

THE various modes of treating gas in its production, solution, &c., having been dealt with, there now remain for consideration the methods of collecting and storing it. They all come under the category of processes of displacement, the collecting vessel, according to the gas under examination, being first filled either with mercury or water or being in the ordinary sense of the term empty (that is, full of atmospheric air), and the contents then displaced by the admission of a gas.

A homely illustration of the process can be obtained by taking a common glass tumbler and immersing it overhead in a bowl of water so as to drive out all air, and then, after inverting it, to partially withdraw it out of the water until its mouth is about a quarter of an inch below the surface. It will be observed that, though the tumbler is almost entirely above the water, none of the fluid escapes; if, however, air from the lungs be blown through a glass tube, the end of which is introduced into the water till it is directly below the tumbler, the bubbles of expired air will rise through the water, ascend into the tumbler, and, collecting in the top, gradually expel the water and take its place.

In the laboratory the bowl of water is replaced by the pneumatic trough, and the tumbler by a gas jar, which rests upon a shelf with which the trough is supplied. The air from the lungs represents any gas that is being collected. The troughs in common use are in shape like a square box; they are also made of a circular form, are constructed of wood or japanned tinplate, and provided with one or more shelves, according to the requirements of the manipulator. The jars or receivers for holding the gas are of various forms, the chief one being a bell-shaped glass similar to the well-known horticultural glass shade, with a knob on the top for convenience in handling. In many cases it is convenient to be able to gain ready access to the gas. This knob is then replaced by a stoppered neck, and this form is again modified in other instances by the addition of a stopcock accurately fitted into the neck. The receiver is sometimes made as a globe, with a suitable aperture for the entrance of fluids, generally in the form of a wide neck with a broad flange.

But for the retention of, and experimenting with, gases these forms of apparatus are by no means to be considered essential, a wide-mouthed bottle with care answering all purposes. A broken bottle that has had the bottom cut off in the manner to be described (under the head of *Glass Working*) makes an excellent receiver when the neck is closed with a good cork. There are times when a lipped measure-glass answers better than any shape of receiver. When it is desired to collect a jar of gas, water is poured into the trough till the shelves are covered to the depth of about half an inch. A receiver of suitable size is then filled with water by immersion in the "well," as the deep part of the trough is called, the mouth pointing slightly upwards, so that all the air may be driven out without commotion. It fills almost instantly, and may then be raised by the knob out of the trough till its mouth is upon a level with the shelf, upon which it is now carefully placed, immediately over one of the funnel-shaped apertures of the shelf, if it be so provided, or projecting over the well for about a quarter of its diameter if it be plain.

The end of the gas delivery tube is now placed just beneath the aperture or the projecting part of the receiver, and the evolution of gas allowed to proceed in a gentle manner. It will rise into the receiver and gradually displace the water. As soon as the level of the latter is the same as that in the trough, or, better, a little higher than it, the delivery tube must be removed to another jar, or the gas conducted away, as described in the earlier portions of the chapter. If the gas be allowed to form too violently it will pass from the delivery tube in bubbles of such a size that the current of water flowing out will meet them and cause their dispersion into a number of smaller ones, the majority of which will escape up the side of the receiver, to be wasted, and to contaminate the atmosphere of the apartment.

The process is indeed the exact counterpart of pouring liquids into a bottle or jar, and the precautions necessary in the one case are equally requisite, in a reversed manner, in the other. When the receiver is on the shelf and full of water it will stand quite firm and solid; but when the water has been replaced by gas it stands in a very unstable manner, and great care must be taken that it does not get overturned, as the filling of fresh jars or the bubbling of the gas is likely to bring about. Carefulness is also necessary to avoid this mishap, when, instead of filling the receiver with water at the trough, it is filled away from it and brought by the aid of a tray of water into its place on the shelf, as, when the gas displaces the water the latter, mixing with that in the trough, raises the general level, and a jar may thus be rendered so buoyant as to topple over. It will frequently be found desirable to remove some of the water out of the trough to prevent these accidents.

It is often desired to keep a jarful of gas at hand for use on some future occasion. This end is attained by immersing a shallow tray in the water and slipping it under the full jar, carefully withdrawing the two together, and transporting them to a safe place, the water brought out by the tray fulfilling the same requirements as that in the trough. It is necessary to keep the jar perpendicular, and to avoid shaking it much, or some of the contents will escape and the remainder would be contaminated with air; and also to allow only about a quarter or half-an-inch of water at the bottom of the tray, as, if more than that depth remained, the jar would be so buoyant that an upset would be sure to occur. These trays are to be purchased ready made; but as efficient a piece of apparatus as possible is presented by an ordinary soup plate.

Gases such as hydrogen or carbonic acid—very light or very heavy—can be collected with little contamination with air without the aid of a trough. For light gases the receiver should be inverted and the delivery tube pointed upwards into it, almost touching the top; the gas, by reason of its lightness, will remain in the highest part, and drive before it all atmospheric air till the receiver is full and the gas escapes from its mouth. For heavy gases the process is reversed, the jar being held mouth uppermost, with the delivery tube pointing downwards, reaching almost to the bottom. The purity of the gas will be better ensured by placing a disc of cardboard pierced with a small hole on the surface of the jar.

As a pneumatic trough is rather an expensive article a good substitute will be a boon to the student of limited means. A most efficient one, answering almost all purposes, is formed from any deep vessel of water by the aid of one or more of the so-called "beehive" shelves invented by Mr. Griffin, to whom chemists are under a debt of gratitude for the introduction of a great variety of new apparatus tending to promote the progress of scientific study. These most useful utensils are made of stoneware, in many sizes, having externally the form of a short cylinder and internally that of a beehive. The "shelf" is open at one end and almost closed at the other, where it presents a flat top pierced with a circular aperture; there is also a dome-shaped aperture in the side. To use it, all that is necessary is to place it in a large bowl or trough of water sufficiently deep to hold a jar on its side, and then to proceed as with the pneumatic trough, the gas escaping from the delivery tube (which is to be directed into the aperture in the side) and entering the jar placed on the top of the shelf through the circular aperture. The internal shape of the shelf being like a funnel the easy conveyance of the gas is rendered more certain.

The final point which claims attention is the transferring of gases from one vessel to another—an operation frequently called for and requiring some dexterity of manipulation, particularly with some forms of vessels. The easiest case will be the transferring from one large jar to another, as, for instance, when it is desired to mix certain gases together, or to convey the contents of a plain to a graduated receiver, &c. The "receiving jar," as the jar to receive the gas may be called, standing on the shelf of the trough, should be brought over the well till almost half its mouth is exposed, and should be firmly held in its place; the decanting or pouring jar, also firmly held, should then be brought close to it, slightly lowered, then tilted over a little on the side farthest from the receiving jar. The mouth of the decanting jar can then be advanced well under the other and inclined still more till a bubble of gas escapes and enters the receiver. The decanting jar may then be placed at a still greater angle, when the gas will continue to issue from it with a rapidity governed by the quickness or slowness with which the decanting jar is inclined. It should be the operator's aim to do this slowly and steadily to avoid the production of large bubbles, which would break up and escape in part outside the jar.

It is a less easy matter to fill small tubes from large jars of the ordinary shape, owing to the difficulty of allowing the gas to escape in sufficiently small bubbles; but with lipped jars no trouble will be experienced. If, however, a small funnel be inserted in the tube, filled with water as in the last case, the gas will readily ascend without loss from decanting jars of any size. The gas may also be first transferred into an ordinary glass measure with a lip, from which it may be again transferred to a tube.

If gas be required in a bladder—as, for example, when experimenting with mixtures of oxygen and hydrogen—it is conveyed into it from one of the jars with stopcocks already alluded to. The bladder, provided with a similar stopcock, should be joined to it by a connecting screw (which is sold for the purpose), after having first carefully ex-

pelled all the air and rendered the bladder pliable by moistening it. The two cocks should then be turned on so as to allow a passage for the gas, which will at once enter the bladder upon the jar being gently depressed. As soon as it is full *both* taps should be turned off again, and the connecting piece removed. A little glycerine and water applied to the bladder occasionally will keep it soft and pliable and prevent it from wearing into holes.

The mercurial trough need not be alluded to here beyond the mere mentioning of it, as it is not likely from its expense to be used by any but the more advanced student. G. Watmough Webster, F.C.S.

## PHOTOGRAPHIC OPERATIONS IN EGYPT IN CONNECTION WITH THE LATE TRANSIT OF VENUS.

[A communication to the London Photographic Society.]

I have been asked to give an account of my photographic operations during my late visit to Egypt in connection with the transit of Venus. This I am happy to do. I should like to add in some degree to the interest of that remarkable country—remarkable for its climate, its river, its ruins, and its history. Where my chief work lay was at Thebes, distant nearly 500 miles to the south of Cairo; and it was a matter of no small anxiety to me how I should transport all my instruments and observatory to that spot. The boats, or "*dahabeaths*" as they are called, would hardly have taken all unless I had engaged one which was out of all proportion to the passenger accommodation which I required.

My party consisted of myself and three sappers, whose names I should like to record, as owing to them, in a great measure, resulted the success of my work. They were Sapper Laffeaty, chief photographer, and Corporal Milne and Sapper Farr as assistants. I may here say that the hearty goodwill with which they worked and carried out instructions, sometimes preparing plates to the small hours of the morning, is beyond all praise. I may truly say that all failures (for failures at first there were) were taken to heart by them equally as much as by myself; and had it not been for the *entente cordiale* that existed between us all the photographs we brought home might not have been so good even as they are. Honestly, I never knew so thoroughly before what a godsend it is to have soldiers who know you to work with you. I am prouder than ever I was in belonging to a corps which can produce such true men. Well, owing to the kindness of the Khedive, I was (with Colonel Campbell, an amateur, who was going to make eye-observations of the transit) towed up the river by a government tug, on which I placed my hut. The instruments I took on board my boat, stowing them, as you may imagine, with most jealous care; for I was going to a place where it was hard to purchase even a nail. All great repairs would have been hopeless.

We started on the 25th October from Cairo, our baggage (which had occupied three large trucks on the railway) distributed as I have indicated. On the 7th November we sighted Karnak just at sunset, and a glorious vision it was. The old ruins seemed like rubies set in the dark green of the palms which rose between us and them. I certainly have never been so impressed by any sight excepting, perhaps, by the first view of the Alps from the Jura, when there was no rail to Geneva, and where one had to go by diligence from Dole. It is really beyond word-painting, and certainly beyond the palette. The scene was soon over, as the sun set, and we were nearly in darkness by the time we arrived at Luxor. The next morning we moored up against an island just above Luxor, and the same day began erecting our observatory. This wooden observatory is one which is well worthy of a study, it is so complete in itself. Each part was accurately fitted, and there was no driving of nails to put it together. Each piece was numbered, and had its own screws and bolts. The roof of the hut all took down, being heptagonal; each shutter forming part of it could be removed separately according to the position of the sun. One fact worthy of record is this—that it is watertight, a quality usually absent from such erections. I had it nearly a year at Chatham before I took it to Egypt, and, to my knowledge, not a drop of rain entered when the shutters were up. After using it so long at Chatham, the feeling of knowing every nook and corner in it was one of intense comfort. The only point in it which would have borne improvement was the dark room, which, for a hot climate, was just a little too small, being eight feet by four, or thereabouts. The internal arrangements were admirable for wet plates, and the additions I made for dry plates answered very well. I will first give a sketch of the drying cupboard, certain improvements in it having been suggested by Corporal Sharpe, R.E. It was a box attached to the side of the wall of the dark room away from the developing-sink. It was divided into two portions in its length, and each length had a separate flapdoor opening upwards, with a lock and key. In each compartment were two shelves, so that it would contain two rows of plates.

The plane of the plates as they stood up to dry was at right angles to the front of the box. The top corner was held by a triangular notch cut in a bar of wood, traversing the box from back to front. (There were, therefore, as many bars as the number of plates that the cupboard could hold.) The bottom corner for draining was held by a porcelain inkpot. The plates when drying were about two and a-half inches apart; and by this means about six dozen plates would be prepared at one working. The size of the plates was 6 × 6 patent plates, slightly ground at the edges.

It was a week before we set regularly to work; there was so much preparation in adjusting the instrument, getting chemicals, and so on, in order. I think it was on the 15th that we took our first sun-picture. We lived on board our boat, our Syrian dragoman, Milhelm Ouardy (a capital man, by-the-bye, and fully up to his work) catering for us. Mutton, chickens, and pigeons were our principal meat, turkeys and ducks being occasionally added as opportunity offered. We took our own liquor with us, a supply of Tennent's beer being laid in for the albumen-beer process. Though not strictly photographic, I will record our times of eating—coffee and eggs at eight, breakfast (really a lunch) at twelve, and dinner at six. We always got up before the sun, which was generally at six o'clock, and went to bed when our work permitted. Up the Nile one does not require so much sleep as at home, the air is so exhilarating.

We had taken out some ten dozen dry plates for solar work, which we had prepared at home, and began exposing them. At first they did not seem to work quite satisfactorily through causes which were overcome; but on the day of the transit we much regretted that we had not more of them. Preparing plates, at first, was easy work enough, as the temperature was equable, never getting cold at night, and, in consequence, we used our Chatham plates too freely, thinking everything would be plain sailing. Alas! the weather changed; the first stone of the season was thrown from heaven (each stone up to the third, according to Mahomedan tradition, increasing the cold), and then everything went wrong. Our baths, which suited daywork, were too weak for the cold of the night, and it was too hot to prepare the plates during the day. Again: the dust interfered, and we were obliged to wait for the dew to lay it before we dared venture on preparing a large batch. We had trial after trial. As fast as one difficulty vanished another made its appearance; and not too long before the transit things looked almost hopeless. Our "stand-bys," the Chatham plates, were at a low ebb, and we had to prepare at least five dozen others before the day. Eventually, however, all difficulties were overcome, and on the day we were ready. It should be mentioned that the difficulties in preparing the same dry plates for ordinary work did not arise; it was owing to the necessity of keeping up great sensitiveness and cleanliness that caused them in great part. I annex a paper* showing the preparation of the plates and their mode of development.† I may mention one fact, viz., that dissolved dried albumen was used instead of white of eggs. It was necessary to find some substitute for eggs in localities where it would be hard to obtain them. Whenever albumen is to be used I use that preparation of it. It is cheap, convenient in form, and (from one maker) perfectly soluble in water. I strongly advise all who work with albumen to give it a trial. I may also mention, in connection with the annexed paper, that the devoloping solutions differ from those I originally published for the albumen-beer process in the *Monthly Journal of the Corps of Royal Engineers*, in November, 1873, as also in the *Year Book* for 1874. Owing to Colonel Wortley's introduction of the strong alkaline developer I increased the ammonia to what I gave, at the same time increasing the strength of the pyrogallic acid considerably. I omitted the bromide for reasons I gave when I first published the process. I have to thank that gentleman for the kind interest he has taken in all matters relating to the photography connected with the transit of Venus.

Some gentlemen apparently seem to find this albumen-beer process not answer, and lay the blame on the beer. I cannot say if it be the cause; all I can say is, that any beer seems to give me equally good results, and I have tried many. One thing, I think, may affect sensitiveness, and that is the collodion. I make mine rotten with water and then add the same unwatered collodion to it till all "crapiness" disappears from the film. I lay great stress upon this point, as I believe the constitution of the pyroxyline is altered by it, and certainly the film becomes more porous. At all events, at Chatham the process is a general favourite with the men and officers; and we stick to it, as we find it the most manageable and the easiest to teach.

I am not aware who introduced the gelatine‡ substratum as it stands. I know it has often been tried before, and failed to give satisfaction. When used with a Blanchard brush it is first-rate.

Such is the process adopted at all stations belonging to the British expeditions, and I hear that it has been carried out most successfully and with less drawbacks than I had in Egypt.

On the day of the transit we exposed a plate about every one and a-half minute during the transit, beginning about twenty minutes after sunrise and finishing twelve minutes before internal contact. This gave us about forty plates to expose. As a fact we exposed about forty-five. Just before internal contact the Janssen slide, which was placed ready in position, was exposed. As you are aware, each plate is made to bear fifty different impressions at intervals of one second of time; and by so doing very small differences of interval between the limb of Venus and

*Drawn up by request of Sir G. Airy, in March. 1874, for the transit-observers.

† This appeared in our last number, page 136.—Eds.

‡ Since writing the paper I find it was Mr. Tunny.

the sun are obtained, and will be used for micrometric measurements. As the time of each exposure is accurately known the results will be valuable. M. Janssen had the credit of first publicly proposing this plan, though it is a method that would have struck anyone who was accustomed to a repeating back in a camera. Mr. Christie designed the form we used, and very ingenious it is. Mr. Dallmeyer carried out the design with his usual ability. More Janssen plates were exposed in the interval between internal and external contact; and the measurement of the cusps will be very valuable, a small difference in the apparent places of the sun and Venus being magnified largely as the limb of the latter is just leaving the former.

The manner we carried out our arrangements during the time was this:—We had six slides and twelve boxes to hold six plates each. These were all lettered, and each plate, in addition to lettering, was numbered from one to six. The whole of the slides, which were numbered from one to six as well, were filled from one box by a man inside the dark room and passed out to the sapper attending on me. As each plate was exposed it was passed into the dark room through a different aperture, taken out of the slide by a second sapper in the dark room, placed in its own groove, and the slide passed to be filled from the next box. I personally placed the slide in the photoheliograph, exposed each plate, taking up the time from my chronometer, and registered the number of the plate as shown on the back, together with the exact time of exposure. The first, thirteenth, and every twelfth plate after were developed during the transit, and the time of exposure was regulated according to the appearance of the image. Naturally, at last, the plates got shorter exposure than they did near sunrise. When we first saw Venus on the sun's disc she was most unsteady; one photograph shows her as a square with rounded corners. The atmosphere was anything but still, the limb of the sun till very nearly internal contact appearing to boil. A fact worthy of remark is that with dry plates with the same exposure the irregularity caused by this atmospheric disturbance is much less marked than with wet plates. I think I can assign a reason for it, which is too long to enter into here.

Directly after the transit had finished the remaining plates were developed. This operation took till the evening. I believe the pictures we brought back have given satisfaction to the Astronomer-Royal; and no higher meed of praise do I desire. From first to last I have found it easy to work for that distinguished gentleman, his clear conception, grasp of mind, and accuracy of thought invariably helping me in any difficulties that have arisen. From our President I received the greatest encouragement at Greenwich.

It is rather the fashion to despise military routine; but I can honestly say that had it not been for military discipline and drill—irksome drill—I believe I could not have carried out all that I desired; as it was, the only hitch on the day that occurred was my fault and not that of any of my subordinates. It was not a great matter—simply forgetting, in one instance, a word of command. As it happened, the mistake was advantageous, as I got a result which I should otherwise not have obtained. The transit day over we took two or three days of rest. Personally I was glad of it, as I believe even the most placid of men would suffer from the excitement of two hours' intense strain on the nerves. Much had still to be done in the way of making duplicates of the negatives; and here we encountered much difficulty. Transparencies are generally easy to make; but, owing to the necessary thinness of the negatives, we found it no easy task.* At length I hit on a mode which carried success. It was this: I *printed* the image on the dry plate prepared as above. The sun appeared to be on unaltered bromo-iodide, whilst the sky was quite strong by reflected light. I then intensified with a wash of—

| | |
|---|---|
| Pyro | ¼ grain, |
| Citric acid | 20 grains, |

with two or three drops of a twenty-grain solution of silver. This answered admirably for our purpose, and the sharpness is fairly equal to the original. These transparencies we accomplished in a cruise we took up the river, when we paid a flying visit to Assouan, the First Cataract, and Philæ, getting back to Thebes for Christmas Day. I packed up the hut on board a country boat, and started homewards on December 27. It was an unexciting process floating down the stream back again to Cairo, though helped by eight oars. However, we found plenty to do in packing up our small traps; and we reached Cairo on January 3. I have not touched on other photographic work than that of the transit of Venus. There is much of interest in it; but time forbids that I should enter into that subject. Suffice it to say that the Nile voyage, undertaken with a view to photography alone, is most enjoyable. Egypt is delightful in almost everything except in the system of *backsheesh* and in mosquitoes, and these latter you lose at Thebes.

I cannot close this paper without referring to the kindness we received from the authorities. The Khedive gave us everything we required; he franked our baggage from Suez to Cairo, and back from Cairo to Suez. He gave us guards, tents, and police. He put at our disposal a steam-tug, and aided us in every possible way, even allowing us the free use of the telegraph for about fourteen hours to obtain our longitude at Thebes. The Eastern-Telegraph managers, Mr. Gibbs and Mr. Cross, were simply invaluable; and Mr. George, an Englishman at the head of the Egyptian telegraphs, went to great personal inconvenience to help us in getting through our time-signals. I have been officially in several foreign countries, and certainly never met with so much courtesy as we received in Egypt. Captain Browne, the head of the expedition at Cairo, reports equally favourable; and the English Government, I fancy, have given an official acknowledgment of it. Our success the authorities looked on as their own, and none more heartily congratulated us than they did. Never were expeditions more carefully planned and organised than they were by Sir G. Airy; and, though perhaps rather expensive, I know I am right in saying that there was here no breakdown due to anybody connected with it. Although New Zealand was unfortunate, I am sure my brother officers were as well (if not better) prepared than the rest of us.

W. DE W. ABNEY, *Capt.*

* The negatives were necessarily thin to allow of measurement.

# Our Editorial Table.

## STEREOSCOPIC SLIDES.

By E. AND H. T. ANTHONY AND CO., New York; J. H. FITZGIBBON, St. Louis, Mo.; and JAMES VALENTINE, Dundee.

PREVIOUS to referring to the merits of the works of any of these artists respectively we wish to speak of them in a collective capacity, and mainly from one particular point of observation, viz., dimensions.

A slide, to be perfect, should fulfil the following conditions:—The distance at which the right and left pictures are mounted apart must be such as to ensure any of the similar portions of the two pictures being by preference a little *less* than the distance between the average human eyes, but certainly not more than that distance. Further: the two elements of the slide must be so trimmed as to ensure a little more of the subject being shown at the left-hand side of the right-hand picture than there is visible at the same side of the other or left-hand picture, there being, *per contra*, more subject to be seen on the right of this latter picture than in the other. Finally: the two halves of the picture should be placed a little distance apart, so as to admit of a narrow strip of the mount being seen between the two.

If these points have been attended to a picture will be produced the parts of which will combine in the stereoscope without the eyes of the spectator having to exert any effort; and this facility of seeing stereoscopic pictures without strain conduces greatly to the comfort of the observer. Further: the combined picture will appear to be thrown far beyond the card mount, which will appear as if it contained a square aperture through which the picture was seen at a distance—much in the same way as one sitting in the interior of a room sees the distant scene through the open window. These conditions must be supplied if we desire stereoscopic slides of the highest class, so far as concerns arrangement. What has been said applies only to the width of the pictures, and must be rigidly enforced; the height of the picture is a matter of less consequence. By mutual consent of the majority of stereoscopic photographers, a standard height of three and an eighth inches has hitherto been adopted for the trimmed picture. This gives a slide the halves of which are proportional and shapely-looking, but to which there need be no restriction whatever as there is in the matter of width. Indeed, there are numerous subjects which are made to suffer severely from the circumscribed and somewhat cramped vertical dimensions; and we are pleased to observe that several photographers—among whom are those whose works have elicited these remarks—are no longer confining themselves exclusively to the use of the time-honoured mount of three and three-eighths inches high, but have adopted one of such increased vertical dimensions.

The mounts of several of the specimens received from our American friends are four inches high, the pictures being trimmed so as to leave a suitable margin of about an eighth of an inch, or, in some cases, a little more. Mr. Valentine goes considerably beyond this, the mounts of his large series being four and a-half inches high, and the pictures trimmed to about four and a-quarter inches.

A few years ago—when reviewing some "panoramic slides" brought out conjointly by Messrs. Murray and Heath and Mr. Warner, but which were in many instances mounted too wide apart to admit of their being seen with comfort—we took occasion to speak in terms of high approval of the endeavour to extend the vertical range of the picture, because with an increased vertical angle of view many subjects, especially those of the ravine class, would have far greater justice done to them than if the foreground had from want of space to be sacrificed. This is certainly the case. In a good stereoscope the eyes may wander up and down to a very great extent, and thus "drink in" many beauties that would have to be excised if a small mount were adopted in every case. But the great temptation to give a little bit more of the sides of the picture

which the photographer so often feels must be firmly resisted, otherwise the slide will be spoiled. As great vertical dimensions as you please, but no more width than the following, which is the measurement taken from one of Wilson's Scottish gems, *Ellen's Isle, Loch Katrine, No.* 36—a picture which, in respect both of composition, effect, and mounting, is unsurpassed by any in our collection. In this series each picture is of the width of two inches and seven-eighths, the distance between similar objects in each half being three inches. With these observations on stereoscopic pictures we now turn to those before us.

The collection of Messrs. Anthony presents a rich variety as regards scenery and subject, including views in California, views showing "the majesty and beauty of Niagara" both in summer and winter, views in the Catskills, views in Florida, views, in short, taken all over America. The enterprise displayed by this eminent house is almost without parallel; for even on the battlefield have their artists managed to effect their operations, as some pictures of "rebel" soldiers seen lying dead on the field painfully testify.

In Mr. Fitzgibbon's views of St. Louis and vicinity we possess the first specimens of burnished stereoscopic pictures we have seen. Of all classes of photographs those intended for the stereoscope are, in an especial degree, most likely to be benefited by the application of the burnisher. Viewed, as they invariably are, through eyepieces of more or less magnifying power, the texture of the paper upon which stereographs are printed is shown with a degree of coarseness fatal to the finished detail of the picture; hence any means whereby the surface roughness of the paper is changed into a polished, homogeneous surface is heartily welcomed in stereoscopic pictures. Burnishing is a very decided improvement to photographs of this class. We shall certainly follow the example set by Mr. Fitzgibbon, and subject some of our own favourite slides to the action of the hot burnisher. From an examination of one of the slides we are enabled to convey to our English readers the fact that Mr. Fitzgibbon himself is an exceedingly pleasant, jovial-looking gentleman, whom it will afford us the greatest pleasure to shake by the hand when he has occasion or leisure to visit this country. As respects the mounting, we find that several of Mr. Fitzgibbon's pictures would have been improved had the component parts been placed about half-an-inch nearer together, because when separate portions of binocular pictures are made to coalesce in the stereoscope, and these portions are wider apart than the distance between the eyes, such coalition is attended with a certain amount of straining of the muscles which control the eyeballs. But, notwithstanding this, we value very highly Mr. Fitzgibbon's views. The large river steamboats, both interior and exterior views, the unfinished *Great Bridge*, the views in *Shaw's Garden*, as well as the other productions of his fertile camera, stamp Mr. Fitzgibbon as an earnest and indefatigable worker.

Mr. Valentine in deeds, although not in words, says—"Which do you prefer?" He sends us some lovely views of Scottish scenery, each of which, however, is duplicated on a more extensive vertical basis. In other words, each picture which is mounted on the old and conventional slide is accompanied by another of the same subject mounted on a much deeper slide, the prints being from the same negatives. It follows, therefore, that in one class of picture there is a very much greater vertical angle of view than is to be found in the other. As a type of these views which have been immensely benefited by this extension we may cite *Waterfall in Glencoe*, which, valuable and beautiful as it is in its circumscribed form, is very much enhanced in pictorial value when an inch and a-quarter more of foreground is added. Of course all pictures will not stand such a vertical distention; for, in point of fact, many subjects would be greatly improved by cutting away much of the foreground. A skilful artist, however, knows at once when a foreground should or should not be curtailed; and thus, limiting his aspirations to his acquirements, he places the one in subservience to the other.

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Treasure Spots of the World. Edited by Walter B. Woodbury.
London: Ward, Lock, and Tyler.

This elegant work contains twenty-eight fine photographs of choice subjects in various lands—"treasure spots of the world." This is, so far as we are aware, the first work of the kind that has been edited by Mr. Woodbury; but the success which must, undoubtedly, attend its appearance, will render it by no means the last work. Unlike most works of a similar class which have been illustrated by photography the charming photographs in this work possess all that permanence which is so thoroughly and justly associated with the method of printing that owes its inception to Mr. Woodbury, whose name in connection with unfading photographs is now universally recognised.

The photographs are produced from negatives by Messrs. J. Stuart (of London, who contributes several exquisite works taken by him during a recent tour in Spain), S. Thompson, W. England, J. Thomson, W. B. Woodbury, Braun, Shepherd, Good, and others. These works possess the highest photographic excellence. Among the contributors to the literary portion of the book, and who are more or less known to photographic fame, we find the names of Messrs. H. Baden Pritchard, Alfred R. Wallace, S. Thompson, J. T. Taylor, and the editor of the work.

The object of the book, which is the first of its class, is to place before the public pictorial transcripts of a few selected portions of the many beautiful spots to be found on our globe, these selected spots being drawn by the Sun himself, and thus true, in contradistinction to works of a somewhat similar character the illustrations of which are dependent upon the whim or taste of the artist whose task it has been to draw them. The aim of the editor has, apparently, been to make the selection as pleasing, varied, and interesting as possible; and in this he has certainly succeeded.

The pictures, which are of cabinet size, are, as specimens of the now well-known Woodburytype, quite faultless in tone and gradation; and we have no doubt that similar works will shortly follow, consequent on the great success of the present delightful volume.

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# Meetings of Societies.

## EDINBURGH PHOTOGRAPHIC SOCIETY.

The Edinburgh Photographic Society gave another of its "popular evenings" at the Queen-street Hall, on Wednesday, the 17th instant, when, as usual, every available seat was occupied.

The exhibition was entitled *Sketches of English Life and Scenery*, and included pictures of several of the principal buildings in London, the gardens and conservatory of the Horticultural Society, the Zoological Gardens and many of their denizens, and a large number of *genre* pictures, illustrating various phases of English life, both grave and gay.

Dr. John Nicol, who occupied the platform, commenced by saying:—Those of you who have been in the habit of attending the popular meetings are aware that the committee charged with the arrangements have always tried to secure for each exhibition a series of connected pictures, which should form the basis on which to build a story, a description of a tour, &c. In this way we have together, during the last dozen years, visited various parts of the world, including most of the grand scenery of our own land—generally with much pleasure and sometimes, I hope, with profit also. To this rule, however, there has been one exception, when the experiment of a series of unconnected pictures was tried, being selections from the works of the best photographers throughout the country. The experiment was so successful that the committee resolved to risk another attempt in a somewhat similar direction. The exhibition of tonight, however, differs from that of the experiment alluded to, in so far that, while the latter consisted of landscape and architecture, the present series is altogether, or almost altogether, composed of figure subjects. I say "almost altogether," as I confess that at the eleventh hour I began to have some misgivings as to the result, and applied for a few pictures of a somewhat different kind. What I wish you to understand is simply that the pictures for the exhibition of tonight are of such a character that each will speak for itself—tell its own story, in fact, better than I could; and, therefore, I shall have little more to do than merely mention the titles, most of which you will find exceedingly appropriate, although you will please to remember that I have neither the responsibility or the credit of them, as I shall simply quote from the printed list. Before the room is darkened I wish to take the opportunity of saying that the members of the Society and, I may say also, the friends who have honoured us with their presence, are much indebted to Mr. York, of Notting-hill, London, who in the most liberal manner placed the whole of his fine collection of lantern pictures at our disposal. The transparencies are all produced by himself, the first part of the exhibition from negatives also by himself, and the figure subjects from negatives by Mr. Gillo, of Bridgewater. Some of my hearers know a little of the difficulties encountered in photographing babies, and will be able to form some idea of what Mr. York had to contend with in getting the negatives of the denizens of the Zoological Gardens. They will, I am certain, when they see the results, agree with me in saying that he has succeeded beyond what could have been thought possible. The pictures by Mr. Gillo prove him to be an artist of no mean ability and a photographer of great technical skill, and, at the same time, give abundant evidence that in skilful hands photography can be readily raised to the dignity of high or fine art.

The pictures were then projected on the screen, and formed a most delightful exhibition, which, with the running commentary of the lecturer, kept the audience in a continuous state of merriment during its whole course.

# Correspondence.

## THE ARCHER-BINGHAM CONTROVERSY.

*To the* EDITORS.

GENTLEMEN,—Although not desirous of reopening the controversy as to the origin of the collodion process, as one of the editors of the *Chemist,* in which journal the late Mr. Scott Archer's process was first published, I trust that you will kindly permit me to make a few remarks upon the subject which at the present time may not be out of season. My object is solely to place Archer's title to be considered the *originator* of the collodion process in a fair light.

It is true that Bingham suggested that collodion amongst other things might be employed in photography; but I do not know that the suggestion took the form of a well-defined process. Archer, on the contrary, communicated to the *Chemist* a perfectly practical process which he had found to be successful, and it was this, with the pyrogallic acid developer, that at once rendered the process popular. Archer did not dignify his process by the exalted title "discovery;" he merely said—"I find that collodion, when properly prepared, is admirably adapted for photographic purposes as a substitute for paper." He had long been engaged in experiments with albumen, gelatine, &c., with a view to obtain a more favourable surface than that of paper for receiving the photographic image; and, with his mind directed to transparent media which would produce a film upon glass, the idea of trying collodion would, one might imagine, readily occur to the experimentalist without any prior knowledge that such a substance had been applied by others working in the same direction.

It is well known that Spencer, of Liverpool, and Professor Jacobi, of St. Petersburg. discovered the electrotype process at or about the same time—each discoverer, no doubt, taking advantage of the deposit of pure copper in the then new Daniell's battery. It is equally probable, therefore, that Archer—who, though an artist by profession, was an enthusiastic experimentalist—*discovered* (I may use the term now in his defence), while in search of a transparent medium to form a film upon glass, that collodion was the most suitable substance.

Having satisfied himself by repeated experiment that he had at last found a successful substitute for paper he lost no time in making it known; and the marvellous rapidity with which the process was circulated and taken advantage of throughout the whole civilised world must, I think, entitle the late Scott Archer to the full credit of being the *originator* of the collodion process commonly so called.

That Mr. Bingham deserved credit for having suggested collodion no one will for a moment deny; but its practical application to photographic purposes was, I submit, established by Archer, and it is to his labours and their free communication to the world that we owe a debt of gratitude to his memory which can never be paid.—I am, yours, &c.,

*March* 22, 1875. ALEXANDER WATT.

## FRESH *versus* DRIED ALBUMEN.

*To the* EDITORS.

GENTLEMEN,—Is there not some error in Captain Abney's paper in your last number? He says dried albumen may be substituted for fresh eggs in the proportion of twenty or twenty-five grains to the ounce. Now, according to Mr. Thomas's directions, seventy-five grains are required to make an ounce of albumen, and this proportion I have found to work well with the Taupenôt process. I should be much obliged if you could set me right, as I am anxious to try the process with the rapid bath, and I shall always now, if I can, use the dried albumen for all photographic work.—I am, yours, &c.,

*Kimbolton-road, Bedford, March* 23, 1875. W. C. CROFTS.

[We shall be glad to have the experience of any who have tried dried albumen.—EDS.]

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

CLEMENT.—Methylated alcohol will answer quite well.

J. S.—The firm about which you inquire is both sound and good.

J. L.—The picture referred to may be seen at our publishing office.

A. Z.—We are unable at the present moment to give such a test as would prove satisfactory. We possess a great deal of information on the subject which will, however, require to be carefully collated.

MARY B.—The defect arises from the landscape being imperfectly lighted. The lighting of a landscape must be just as carefully watched and studied as that of a portrait, and very much of the success of the works of our best landscape artists is to be attributed to care in selecting the proper moment for exposing.

R. M. SMITH.—Not having tried the lenses mentioned we are unable to speak from personal knowledge; but we have no doubt that, if an exposure three or four times in excess of that of an ordinary portrait lens be not objectionable, portraits may be taken possessed of great excellence, so far as excellence can be obtained by optical means.

ST. NINIAN'S.—Our correspondent has added some ether to his collodion, which addition has caused it to assume a very red colour, and he asks if this proves the ether to be impure or made from methylated spirits. In reply we remark that the red colour is caused by the acidity of the ether added to the collodion. Had the ether been neutral no such redness would have ensued.

A. M. D.—We invariably decline to recommend the productions of any particular optician. Both the makers named by you are good; for the rest study their catalogues carefully and select the lens which, in your estimation, appears best adapted for the class of work for which it is required.

WANDSWORTH.—Let the plate be sensitised in the ordinary nitrate bath, and then be subjected to a wash of a very acidulated solution of nitrate of silver, acetic acid being used for this acidulation; a subsequent wash previous to the application of the preservative will render it a good and reliable plate, although it will not possess so much sensitiveness as some others.

B. SCOTT.—Yes; the oxymel process is undoubtedly a very sure one, but it is also very slow. It is many years since we discontinued its use, and we cannot recommend you to adopt it unless it may be by way of a passing trial. The proportions we adopted in the preparation of oxymel were honey one pound, acetic acid and water of each an ounce and a-half. These proportions may be varied.

J. B. C.—Although your invention is novel and good we cannot go so far as to advise you to secure it by patent—because, in the first place, it will never pay you; and, secondly, because the points of difference between it and pre-existing inventions for a similar purpose are so trivial that they would scarcely be recognised in a court of law should it be your ill fortune to have to come before the Chancery Court as a plaintiff.

NOVICE (Norfolk).—We do not think you are quite such a novice as you would have us to imagine, but we reply to your query as well as we can. The angle of view embraced by a lens may either be obtained from marks placed upon the upper side of the camera or by means of a view meter. This is an instrument which, when applied to the eye, enables one to see so much of nature only as the lens will project upon a plate of any given dimensions. The most primitive form of view meter consists in holding an opaque card, with a square aperture cut in it, at a little distance in front of the eye. This is the crude idea, which has been greatly improved upon of late.

SPOTTING NEGATIVES.—YOUNG AMATEUR writes—"I find that a correspondent—'J. T. A.'—wants to know how to spot out negatives. Well, that was just what I wanted to find out myself some little time ago, and looking over *Workshop Receipts,* by Spon (a very useful book, by-the-bye), my eye fell on 'a vehicle for colour,' so I thought that that was, perhaps, a good way to 'vehicle' some lampblack on to the skies of negatives. I got a one and a-half ounce bottle, put in a drachm (by measure) of shellac, the same quantity of ammonia, and filled up the bottle with water. After it was nearly all dissolved I took a little of it, with a knife incorporated some lampblack, and got the whole into a nice, smooth paint. This does not chip in the sun and is easy to work. I hope 'J. T. A.' will try it."

G. S. PENNY (Cheltenham).—Our correspondent has been recently experimenting on the production of pictures on plain paper, and sends us some notes on the subject, which we publish. We here take occasion to say that No. 1 and No. 7 are the finest pictures of the series sent by Mr. Penny in illustration of his remarks, which are as follow:—"In fulfilment of my promise I now send you a report of my experiments in plain paper printing, with samples of some of the more successful results. The au otype transfer papers give the best results I have seen. I have not tried the process you lately recommended in its integrity, but have borrowed from it the orange juice suggested, which makes my former formula more sensitive. Please tell me, taking No. 1 lac and No. 7 geletine transfer papers as samples, whether they come up to the standard of that you recommend. Nos. 2 and 3 are rather wanting in power from the loss in toning and fixing being more than I calculated. No. 3A has suffered in the same way, and the negative from which it was printed is rather too soft. No. 6B shows the defects occurring in the lac transfer from imperfect preparation; also that there is a salt in it which is rendered sensitive by nitrate of silver—I conclude it to be biborate of soda. I have also used benzoin as a medium for filling up the pores of the paper, to keep the picture on the surface. No. 15 contains nothing but benzoin, except the sizing of the paper, so that the sensitive salt I take to be benzoate of silver. The other Nos., you see, are salted with an emulsion of benzoin and gelatine, those prepared on the back of the lac paper giving the greatest vigour, due to the borax salt already in the paper This is, of course, little more than a conjecture, as I do not know how the paper is prepared, but conclude the lac is dissolved in borax solution. The papers were floated, in salting and sensitizing—silver bath about fifty grains to the ounce—toned in an old tungstate bath to different degrees, the lac paper giving the peculiar lavender tint borax, the lights having a slight India tint, which to me is pleasant, when coupled with the assurance of its not being produced by sulphuration. I should suppose such papers would be fairly permanent. The Hollingsworth paper is not good—certainly not for pictures to be used as transparencies."

REJLANDER MEMORIAL FUND.—We beg to call the attention of our readers to an advertisement in the present number referring to an endeavour that is being made to raise a memorial fund in connection with the late O. G. Rejlander, with a view of liquidating some liabilities existing at the time of his decease, and also with the view of making some provision for his widow. We have already received donations from two or three sincere friends of the late Mr. Rejlander, which have been applied in a way that cannot fail to secure their hearty sanction; and we hope the appeal now made will receive a cordial and satisfactory response. The late Mr. Rejlander, be it observed, was a man to whose memory photographers may well contribute of their abundance. We heartily commend the appeal now made to the sympathies of the readers of this Jonrnal.

CONTENTS

THE BRITISH

# JOURNAL OF PHOTOGRAPHY.

No. 778. Vol. XXII.—APRIL 2, 1875.

## THE CHLORIODO-BROMIDE PROCESS.

During the last four or five years probably no branch of our art-science has received greater attention in the photographic journals than have the various emulsion processes. Ushered into existence in a practical form little more than ten years ago, it appeared doubtful for some time whether collodio-bromide would ever take rank as a distinct and workable process, its use being confined to a few members of the Liverpool Amateur Photographic Association, among whom it had its birth. The gentlemen who thus early recognised the value of the new process belonged to the class of working photographers rather than to the writing class; and, though many valuable papers were read at their own meetings, and subsequently published in the pages of The British Journal of Photography, it remained for our able and indefatigable correspondent, Mr. M. Carey Lea, to take the matter up and induce the photographic public to believe that there really was something in the collodio-bromide process.

Mr. Lea published his first researches in our columns early in the year 1868, since which time, as our readers are aware, he has devoted the greater part of his attention to, and has been recognised as one of the champions of, emulsion photography, having introduced several modifications and improvements on the original process. Ill health had, unfortunately, deprived us for some months of his valued contributions; but his first work, upon resuming his pen, has been to publish another improvement, which, if Mr. Lea do not speak too enthusiastically of it, promises to be the most important of any yet introduced.

The employment of chloride of silver in conjunction with bromide, as proposed by Mr. Lea in the chloro-bromide process, was the first step towards an increase of sensitiveness in emulsion plates, and this was shortly followed by the use of an excess of silver restrained by *aqua regia*.

The latter modification caused at the time much difference of opinion amongst emulsion workers, who had up to that period held an excess of soluble bromide to be a *sine quâ non*. The new chloriodo-bromide process is, however, if possible, even more subversive of preconceived notions of orthodoxy; for, since the early experiments of M. Gaudin and those of Captain Dixon to emulsify iodide of silver, it has been thought to be only possible in the presence of a considerable excess of soluble iodide. So strong was this idea that special care was directed to be exercised in procuring a sample of bromide free from any trace of iodide, any such contamination being supposed to spoil the emulsion by bringing about the precipitation, not only of the iodide, but of the bromide also. Curiously enough, Mr. Lea was one of those who held this idea most tenaciously, and we ourselves, from personal experience, can testify to the failure of several attempts to form a bromo-iodide emulsion.

Now, however, we are told that such an emulsion is not only practicable, but that it is actually the best and most sensitive ever used. In the matter of sensitiveness it is difficult to explain, theoretically, why an iodide emulsion should excel a bromide one. We can perfectly well understand that the introduction of an iodide might confer advantages in the prevention of blurring and, possibly, in an increase of vigour and density; for we know that bromo-iodised plates prepared with the bath are less liable to blurring and more easily intensified than simply bromised ones, but the latter are infinitely more sensitive. Then, again, the ordinary strength of the alkaline developer as used for bromide plates is without effect upon the iodide, though, as shown by Mr. W. Robinson in our last year's volume, the latter is acted upon by a more powerful solution.

We see yet another theoretical objection to the new emulsion. It has been urged against emulsion films in general—with what justice we are not prepared to say, as we have not found it so ourselves—that the deposit is much coarser and more granular than in films prepared with the bath. Now it appears to us that the iodide, from the rapidity of its formation when its elements are brought into contact, cannot but aggravate this evil. We succeeded once, by dint of much shaking and with a large excess of soluble haloids, in forming an emulsion which, *in the bottle*, appeared to be all that was desirable, but which gave a film of a peculiar lavender colour by transmitted light, and under the microscope exhibited such a degree of granularity as to render it wholly useless for working.

It is quite possible, as Mr. Lea suggests, that a definite compound may be formed between the bromide and the iodide possessing distinct properties; but it still remains to be explained why this compound, if it really do exist, should not be more sensitive than bromide alone when formed in the nitrate bath—why, in fact, it should act differently when formed in the film on the one hand and in an emulsion on the other.

At the earliest opportunity we shall give Mr. Lea's process a fair and impartial trial, and will communicate the result to our readers. Meanwhile, we can only say that, if it bear out all Mr. Lea's enthusiastic encomiums, that gentleman will be entitled once more to the heartiest thanks of the whole photographic world.

## DRY-PLATE MECHANICAL APPLIANCES.

### No. I.

It is in the month of April, when nature assumes a gay, smiling, and inviting aspect, that landscape photographers feel themselves quite alive to the artistic work of spring and summer. The wise photographer will have already decided upon both the process and the apparatus to be used by him during the forthcoming season; but as in neither the one nor the other department can too much be said, especially in the spring of the year, we purpose to occupy a brief space in descanting upon the subject of apparatus, with a view to bringing forward something which, although it cannot be quite unknown, will yet, we believe, prove very useful.

In one of our numbers last month (March 12) we described a camera introduced by Mr. Aird, of Edinburgh, in which the sensitive plates are withdrawn, one after another, from a plate-box or reservoir below, by means of a plunger. We have been informed that this idea was long since carried out practically by a member of the Liverpool Amateur Photographic Association, or, at any rate, by an exhibitor at one of the meetings of that Society. As we are aware that the mechanical ingenuity displayed by our Liverpool friends in

the early days of our art-science was of the very highest order, we have no difficulty in understanding how they have put this idea into practical shape, more especially as one of their number, Mr. Atkinson, was the manufacturer of a camera of a nearly similar kind described in the journals nearly twenty years ago.

The problem to be solved is—the most effective mode of conveying a sensitised plate from the plate-box to the camera with the greatest possible amount of security and certainty, involving the least amount of expenditure of mechanical means, and, therefore, of cost. A plate-box placed in contiguity above, below, or at one side of the camera, and connected with it by an open slit, so as to allow the plate to pass from one to the other and back again, forms the desideratum.

During the past week we have seen a camera—roughly made it is true, but acting extremely well—in which has been carried out in a very effective manner the conditions of the problem to which we have just referred. It partakes, to some extent, of the Atkinson form already alluded to in our last article, and, to some further extent, of the form of a camera introduced three years ago by Mr. Grubb. In order that the precise position it occupies with respect to these two cameras may be perceived we subjoin such details of its form as will enable an intelligent mechanic to construct one for himself.

The camera is so constructed as to contain the plate-box in its interior. This plate-box has a sliding cover with a slit in it; the slit may be moved so as to be over the top of any one of the plates in the box, and through which the plate may be passed out. The lid is, of course, constructed in such a way that, whether number one or number twelve of the plates be opposite the slit, all the others are covered in securely. Here is the next point:—The plate-box is so made that it can be attached to the top of the camera in such a way that any plate which is opposite the slit in the cover will drop down into a corresponding groove in the camera. Hence, as soon as the plate-box is removed from the interior and fixed upon the top of the camera the plates will, in accordance with the law of gravitation, drop downwards whenever the opportunity of doing so is presented.

The camera is fitted with the usual focussing-glass, which, by means of two delicate wire springs, is kept pressed closely against the anterior face of the slit in the camera, which corresponds with the plane of delineation. There is also a folding door to the camera, in the centre of which is fixed one of the usual and well-known pneumatic india-rubber suckers, which operates by pressure on an elastic ball behind. When the focus is received the hinged back-door is closed, and the ground glass, when the thumb is pressed against the india-rubber ball, is pulled back, leaving the entire space clear for the descent of the sensitive plate.

After numerous trials we have ascertained that the simplest and best way of ensuring the descent (and subsequent ascent) of the plate is the following:—The camera must have two bottoms—one being a loose one connected with the bottom proper by means of three pins, and bearing the screw-nut by which the clamping with the camera-stand is effected; the other a bottom which can be connected with that already mentioned by simple dowels or steady pins, so that if lifted off it may again be placed on with the certainty of no change of position having been made. When the focus has been adjusted the ground glass is pulled backwards, the camera raised off the false bottom, and the plate-box made so to slide backwards or forwards as to bring any one of the plates it contains over the slit in the camera, into which, by the simple act of tilting, the plate immediately passes. The whole is now replaced on the false bottom, when, by uncapping the lens, the exposure is made.

To transfer the plate from the camera to the box the apparatus has merely to be tilted, when the plate at once resumes its former position in the plate-box, having, in the meantime, been impressed with the latent image.

The apparatus we have here described has only been made in the rudest manner; but it acts so well that we venture to recommend it very strongly to the notice of camera makers and photographers possessing mechanical proclivities, who will not fail to improve upon it. It is sufficient here to say that, notwithstanding the roughness of its construction, it works faultlessly.

It was our intention to have made some observations on the best automatic means of closing the aperture in the changing-box, with special reference to an admirable method adopted in one we have lately seen, and which was manufactured by the American Scovill Company; but this we must reserve for a future number.

## ON THE ACCUMULATION OF APPARATUS.

Why do amateurs collect such large quantities of apparatus? and why does that which costs so much realise so little when brought to public sale? Some such questions as these occurred to us recently in connection with the sale of a large quantity of mechanical, chemical, and photographic apparatus which we watched with considerable interest.

We had been requested by a friend to examine his collection of apparatus and *matériel*, and advise as to the best means of arranging the whole for sale by auction, circumstances having arisen making it inconvenient for him to continue their use. After spending a further considerable portion of a day in the examination of our friend's accumulations in this direction—an occupation from which we derived much pleasure, for we must confess to thoroughly enjoying the examination of such a collection—we roughly, yet we think with tolerable accuracy, valued it at something over eight hundred pounds. Everything was in perfect order—in fact very much of the stock valued had never been once used; and, although its accumulation had extended over a considerable period, there were hardly a dozen items that could be considered in any sense antiquated. The sale had been thoroughly advertised, the auction room was filled with probable buyers, and yet from a priced catalogue now before us we see that the whole sum realised was slightly under two hundred and twenty pounds!

With the chemical and mechanical apparatus we at present have nothing to do; but we think our readers may learn a useful lesson from a little consideration of the result of the sale of the photographic apparatus. This we, of course, examined somewhat carefully, and are in a position to say that it could not have cost our friend less than one hundred and fourteen pounds; and yet, although it was arranged in suitable lots and in the most perfect order, it only realised forty-four pounds. How this result was brought about will be evident from an examination of the products of a few of the items.

A $7\frac{1}{2} \times 4\frac{1}{2}$ camera, by one of the most celebrated of English makers, with one single and four double slides, three lenses, and instantaneous shutter, the whole arranged in a solid leather case, and costing twenty guineas, was knocked down at nine pounds ten shillings. A three and a-half inch landscape lens by another celebrated maker, and one of the same diameter, by Lerebours, only commanded two pounds twelve shillings. Twenty-five printing-frames, varying from $8\frac{1}{2} \times 6\frac{1}{2}$ to $5 \times 4$, the majority being of the larger sizes, only yielded twenty shillings; while thirty walnut plate boxes, containing over one hundred dozens of plates, and much of it patent plate, were sold for four pounds two shillings and sixpence.

In a recent article we had occasion to mourn over the fact that the number of amateurs is at present at a low ebb; and we are sure that there can be no better proof of that statement than is afforded by the result of the sale alluded to. As we before remarked, however, we believe that the recent introduction of more than one simple process will go far to revive the interest in our art and restore it to its whilom popularity. Those who are already amateur photographers, and those who may by-and-by become so, will do well, perhaps, to lay to heart the lesson which the result of the sale here referred to is calculated to convey. We fear we have all been too much in the habit of getting over our conscientious scruples, when anxious to possess some new piece of apparatus, by assuring ourselves that "a really good thing must always bring its own price," but "its own price," as we have already seen, sometimes turns out to be miserably small, and very different from what had been paid for it originally.

To those about to commence the practice of photographic art as amateurs we would say, not as is generally advised, "begin with a small outfit till you see how you get on," but consider carefully what size of plates you are likely to continue to work, and get the best

apparatus that your means will afford for that size and adhere to it. Changing sizes is very much like changing processes. It is all very well for those who merely wish to experiment, and have both time and means at command with which to gratify their wishes; but for those who only desire good pictures, and have little time to make them, it will be found conducive to success, and to economy as well, to keep to one particular size of plate.

We are aware, however, that with every desire to carry out this idea there come times and circumstances when a new piece of apparatus is considered necessary and when the old article will be laid aside; still it should not be placed on the shelf or in the cabinet, but transferred as soon as possible to some one whose circumstances it will just suit. For this purpose we think our "exchange column" might be more fully taken advantage of than it usually is, and with great advantage to the exchangers, by helping to keep their purses full and their lumber rooms empty.

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In a recent article on the proposed Patents for Inventions Bill—in which we gave a *résumé* of its leading peculiarities, showing also the points of difference between it and the existing patent law—we stated that the bill was then being submitted to a committee who might probably alter its features to some extent. The bill has now passed through committee, the result being several alterations in minor details, none of which, however, affect the chief features or principles of the bill, which remain substantially as described by us at page 109 in our number for March 5th, subject to the slight alterations we here point out. Whereas, in the original draft of the bill the invention for which protection was sought had to be submitted to an examiner *and* expert referees, the application is now to be entrusted to an examiner alone, although provision is made that in special cases the examiner will be aided by expert referees. Further: whereas in subsection *f* it was proposed that the examiner was to report, *inter alia*, whether by reason of the frivolous character of the invention, *or for any other reason*, the invention was not worthy of a patent, in the amended bill the words "or for any other reason" have been struck out. According to the bill as it originally stood, it will be remembered, foreigners could not obtain a patent upon such easy terms as hitherto; according to the amended bill they will no longer be prevented from obtaining a patent in this country by reason of the circulation or republication of the foreign patent, or of any specification or document referred to therein or connected therewith, but the application must be made, in this country, within six months from the date of the foreign patent. From the foregoing it will be seen that the new patent bill, as described by us a month ago, will, with a few unimportant modifications, shortly become an Act of Parliament.

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## THE DIMENSIONS AND PROPORTIONS OF PORTRAITS.

The introduction of a new size for photographic portraiture, though not an event to be marked as a red-letter day in the calendar of photography, cannot but be interesting to those engaged in the production of pictures by the camera. The commercial aspect of the question has been considered, but its merits from a fine-art point of view seem to have been forgotten or ignored; yet, in my humble opinion, it is not a subject altogether unworthy of a little thought.

Photographic writers are very apt to refer to the works of Vandyke, Reynolds, Gainsborough, and such luminaries in art; and this fact induces me to give a list of the sizes of the various canvases employed by those great men in the production of their portraits, viz.:—

| | Feet. | Inches. | | Feet. | Inches. |
|---|---|---|---|---|---|
| Head | 2 | 0 | by | 1 | 8 |
| Three-quarter | 2 | 6 | ,, | 2 | 1 |
| Kit Kat | 3 | 6 | ,, | 2 | 4 |
| Small half-length | 3 | 8 | ,, | 3 | 4 |
| Half-length | 4 | 2 | ,, | 3 | 8 |
| Bishop's half-length | 4 | 8 | ,, | 3 | 8 |
| Whole-length, sitting | 6 | 0 | ,, | 4 | 0 |
| Whole-length | 7 | 10 | ,, | 4 | 10 |
| Long whole-length | 8 | 10 | ,, | 5 | 10 |

If it be conceded that the works of these artists are worthy of imitation, then, I think, the sizes they adopted should be the bases of the scale for the dimensions of our pictures. Exceptions might be found to some; but certainly three of them—the whole-length, half-length, three-quarter or head size—should be scaled on the above proportions.

The main difficulty in adopting these measurements lies with the manufacturers. They appear to have come to the conclusion that only one size is good for the purpose, and that size is the mean and lanky *carte de visite*. If you attempt to discuss the matter with a maker of photographic frames, he will rejoin:—"We study the requirements of the public, and not the caprices of photographers. We find the frames and albums we manufacture sell well enough—that is sufficient for us." These commercial despots forget that a good-shaped frame or album has not yet been made, and, consequently, the public has not had an opportunity of escaping from the regulation pattern, and adopting a good thing. I may remind them that many people of refined taste repudiate albums altogether, preferring to keep their pictures in boxes.

If, in spite of reason and taste, manufacturers still refuse to provide albums containing three sizes, surely a medium size—similar to the cabinet, but larger—should be selected. This, although a little too wide for a whole-length, is admirably adapted for the half-length, three-quarter, or head size.

Our lawgivers—the manufacturers—should have some pressure put upon them to ensure their adhering to the sizes selected, otherwise they will deviate a quarter of an inch, one way or the other, as I have experienced more than once.

A writer on art has said: "Proportion is the basis of beauty." Again: "Excellence is made up of the little more or the little less." (I quote from memory.) These golden axioms apply with peculiar force to photography, which, being so poor in resources, should seize upon every judicious expedient to promote its excellence, even in the apparently trifling matter of the proportions of frames and mounts.

Robert Faulkner.

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## NOTES ON PASSING EVENTS.

By a Peripatetic Photographer.

Let me commence this month's *Notes* by paying a tribute of respect to the memory of Thomas Sutton. The "Peripatetic Photographer" and Mr. Sutton were on terms of personal intercourse of the most friendly kind, and numerous have been the letters which passed between them. Of the identity of one of his, doubtless, numerous correspondents with the authorship of these *Notes on Passing Events* Mr. Sutton was evidently unaware. Speaking of some remarks of a decidedly critical nature which had been made by the "Peripatetic Photographer," my friend was good enough to say in a letter to me—being little aware that he was then addressing the veritable "Peripatetic" himself—that it was incumbent on him to be exceedingly careful of what he wrote in The British Journal of Photography, for if there was a joint or weak point in his armour that generally unknown correspondent of the Journal would be sure to find it out. And Sutton is gone! I most unfeignedly deplore his untimely decease. He has not, however, lived in vain. The photographic world has been benefited by that busy life. I fully recognise the exceeding difficulty of indicating in a definite manner the exact amount of benefit conferred by a man upon the little world by which he is surrounded, or the precise amount of influence he exerts upon it; but I do assert that the influence of Mr. Sutton upon the photographic world has been sufficiently marked to be at least recognisable, and I await, with stimulated interest, the promised editorial *résumé* of the leading incidents in the public photographic career of the man of whom we have just been deprived. A strange compound was Sutton. He sometimes wrote harsh things, which by no twisting of the English language could be otherwise than harshly construed, when I thoroughly believe that in his heart he would utterly repudiate such sentiments and the inferences which might inevitably be drawn from his communications. Indeed, I am aware of particular instances in which he was greatly surprised at the conclusions drawn from what he had written, protesting, as he did in his letters to me, that such deductions were not always those which he desired or intended should be drawn. Fare thee well, Sutton! The good that was in thee far outweighed those occasional eccentricities in which of yore—not recently—thou didst sometimes indulge. May we meet again!

Dangerous work, Mr. Hanson, to introduce theological dogma into photographic practice! Sunday photography may be looked at from two points—from those of moral law and of British law. To the

former we, as photographers, had better give a wide berth; but with "moral" here let me connect *Mosaic* law, so as to enable us better to understand the matter. There is, I opine, nothing really immoral in working every day in the week. If a thing be sinful on Monday it is also sinful on Sunday or Saturday, and *vice versâ.* But the law of the land says—"Thou shalt not" take photographs on Sunday. Does it or does it not? That is the question. It is quite illegal, we all know, to vend sugar-sticks by the road side on Sunday, especially in the western portion of the metropolis; is it illegal to take photographs on Sunday in those portions of London which, being east of Temple Bar, may be designated the "City" or "eastern districts?" The opening of photographic establishments, or the carrying on of establishments already devoted to Sunday work, must be withdrawn altogether from the region of morals (whatever that may be), and be relegated to that of law. If the law says—"Thou shalt not carry on thy usual business on Sunday," then photographers must close their establishments, no matter at what sacrifice of their pecuniary interests. I quite abstain from saying a word concerning the expediency of having either one general holiday (in the sense of abstention from labour) in the week, or one whole day being devoted to spiritual, as distinguished from secular, avocations. Let it rest upon a matter of law. If the law can compel the conductor of a saw-mill in a leading thoroughfare to close on Sunday, on what principle does it allow another tradesman, even if he call himself "artist," to go ahead with his work during that day?

An Edinburgh photographer, Mr. David Aird, has described a camera for out-door work, containing a number of dry plates that can be exposed in rotation or otherwise without the possibility of failure. But have not several, if not many, cameras of a similar construction been introduced more than once? In Mr. Aird's camera the unexposed sensitive plate is "fished up" or "hooked up" from the plate box and is exposed in the camera; in similar pre-existing cameras—of the nature of which it is possible Mr. Aird was not aware—plates have been passed from the plate-box to camera and repassed from camera to plate-box without the remotest chance of their coming in contact with a gleam of light. The fishing-up system advocated by Mr. Aird is, or ought to be, well known in certain districts in the provinces, having been introduced many years ago by a Liverpool photographer, to whose *confrères* in the active society of that great northern seaport it was communicated. But this only confirms the sagacious deduction of the wise King in Sacred Writ, "there is nothing new under the sun." But we must give Edinburgh photographers full credit for excellent intentions, even though some of them, especially as repects camera-making, may be a little behind the times. The last camera introduced there—about ten years ago—by Mr. Chapman was not new in the sense in which some members of the northern society claimed novelty for it, as it had already been in existence for several years. I am rather afraid that of Mr. Aird's camera the same thing may be stated. However, I entertain no doubt that the camera has been really "invented" by himself, even if others were beforehand in the matter, and I give him credit accordingly.

It is rather amusing to notice the frantic efforts made by certain photographers to secure for themselves and colleagues what is termed "status." In a certain town in the south-west of Scotland there dwelt, in a lane known as Irish-street, a certain milliner and dressmaker who, by dint of—well, say merit or some equivalent qualification, managed to take rank with the "upper ten" of the locality. She was received everywhere on terms of something akin to equality, and if nuptially inclined she might have married into the family of a lawyer or even a retired admiral, or that of an officer of the British army. She turned up her nose at those sisters of her craft who occupied positions of less social eminence in the same town, and would consider herself insulted were she invited to meet any of them at a social gathering. Photographers! bear this in mind. It is the man himself who determines his status in the world, and not the trade or profession to which he happens to be attached. The proudest potentates the world has seen insist upon their being recognised as descendants from a *quondam* humble fisherman. It is, perhaps, natural that a photographer who "does" *cartes* at a few shillings per dozen should desire to rank on terms of social equality with the President of the Royal Academy, the Archbishop of Canterbury, the Lord Chancellor, and similar notabilities; but it will not do. It has been privately reported that, at a recent meeting of a certain photographic society in London, a gentleman present, speaking on the probability of the status of photographers being raised, said the prospect was by no means so remote as he had once thought; for that, owing to the recent School Board Act, by which every class would be ensured the benefits of at least the elements of education, photographers, some of whom could not do much more than write their own names, would in years to come be better able than they now are to claim equal rank, as respects social standing, with the archbishops of the church and the great dignitaries of the land. What social status can a photographer expect who cannot spell the personal pronoun "us" without the aid of the letter *h?* I do not wish to say anything unkind with regard to photography *versus* painting; but I know of one photographer who, after six lessons and three weeks' practice, produced photographs which were said to be indeed very excellent. People who aspire to fame by means of the brush and canvas do not soar to eminence quite so rapidly as this.

As Captain Abney's dry-plate process has been again brought before the public by the publication of the papers recently read by him at the London Photographic Society, I would like to introduce one point for the consideration of those who may be able to allay a certain prevalent amount of uneasiness with regard to the process. It is said—and, I understand, not without much truth—that beer contains a certain mixture, legally limited, of chloride of sodium. Now, what I wish to ascertain is this—will the presence of this chloride not interfere very seriously with the sensitiveness of the plate? Chloride of sodium, as I am aware from numerous experiments, destroys sensitiveness. What effect will this salt have when present in the beer used in the beer and albumen process of Captain Abney? Would it not be an improvement if a plain infusion of malt were used instead of commercial beer?

## THE CONTINUATING ACTION OF LIGHT.

In your last issue Mr. Batho has some remarks on the continuating action of light in the dark, and I venture to make a few remarks thereon. I may state that, to the best of my belief, the tissue with which our experiments were made was quite dry; in fact, during a discussion that ensued on Mr. Baden Pritchard's paper on the subject, which he read at the London Photographic Society on the 9th April, 1872, I said—"It is important to keep the tissue in a dry atmosphere, as too much moisture retards the progressive action in the dark. Wet quite destroys the sensitiveness of the bichromated film—a fact which enables prints to be developed in daylight."

I should like to point out what I consider may have been a source of failure with Mr. Batho. The tissue we used was ready sensitised—that is, the bichromate and gelatine were mixed together in a liquid state; and I am under the impression that the action is different when these bodies are so mixed to that when a gelatine film is simply immersed in or floated on the bichromate solution. In photo-mechanical printing the continuating action on a gelatine film is very marked, and I believe I am correct in stating that in Woodbury-type this action is taken advantage of.

At Woolwich, as Mr. Pritchard has stated, his prints are subjected to the same action. I never for a minute intended to say that there was some chemical action *induced* by darkness, but rather that the action was *continued during absence from light;* in fact, I looked on it much in the same way that I look on the gain of intensity by a negative through the deposit of metallic silver on the silver already deposited by the developer.

That there is a method of "continuating" the action of actinic light by what is called "non-actinic" light is another question, and one about which I may have more to say shortly. Facts are very stubborn things, and it is a fact (notwithstanding Mr. Batho's failures) that the action I described in December, 1871, was utilised by us at Chatham, and subsequently by Mr. Pritchard at Woolwich. I should wish Mr. Batho to try the experiments with the same tissue we used, and prepare a film himself made as I have indicated. I think he would then see that the action set up is continued, not by darkness indeed, but by the impact of previous light.

W. de W. Abney, *Capt. R.E.*

## FOREIGN NOTES AND NEWS.

Herr Remelé's Albums. — Dr. Rohlf's Expedition to the Lybian Desert.—M. Geymet on Heliochromy.—A New Method of Printing Panoramic Pictures.—The Prevention of Blurring.—A New Developing Solution.—Experiments on the Intensity of Light.—Improvement in Photolithographic Transfers.—Troubles with a Dubroni Apparatus.—Sugar in Collodion.—New Formula for the Plumbago Process.

According to the Cologne *Zeitung* a hundred superb albums, containing a collection of fifty large selected views—prints from negatives

taken by Herr Philipp Remelé in the Lybian Desert—have lately been distributed amongst various important personages, learned societies, and individual *savants*. Last winter the Khedive sent a party of five Germans, under the command of Herr Rohlfs (whose lectures on Africa are well known all over Germany and America), on an exploring expedition into the less-known parts of the Lybian Desert. Herr Remelé was the photographer of the party, his object being to bring away views of the most remarkable places visited during the journey. How skilfully he accomplished the difficult task entrusted to him would best be shown by the collection of views above referred to; but, unfortunately, there are no copies for sale, and we have to depend on the descriptions given us by those who have been favoured by an examination of one of the albums. The tourist who seeks in winter the hospitable banks of the Nile can carry away with him any number of photographs of every nook of that ancient home of art and culture, but few that even approach in sharpness of detail or in the artistic selection of the point of view those of Herr Remelé. Besides, none of the photographers who work in the Nile valley have penetrated the wilderness of Dachel, the fertile valley affording them sufficient occupation, and the desert presenting comparatively few attractions. Dr. Schweinfurth's opinion of the photographs in question may be thus summarised:—

Herr Remelé had to take as few things with him as possible on account of the long distances, yet his easily-broken apparatus had to be carried on the backs of stubborn and stumbling camels. His views were all taken by the wet process, yet he had to contend with storms and clouds of dust in the desert, scarcity of water and unprecedented dryness of the air. Notwithstanding all these "lions in the path," in one view beam the motionless forms of wild masses of clefted rocks, flooded by rays of dazzling sunlight, standing out in awful solitude against a sea of sand and stone; in another, the palm on its slender, swaying stem nods as it contemplates the hospitable oasis with its shady acacias and long-desired streamlets. In others we see the villages and townlets of the oasis shaded by thick date palms which bend in green domes over the houses of the peaceful inhabitants. This last is a complete idyll, such as Juvenal may once have enjoyed in his exile here, where, after him, Antonius and many other pious men, "the world forgetting, by the world forgot," ended their days.

Herr Remelé himself, on his return to Germany, sent a long account of his journey to the Berlin Photographic Society, the substance of which may interest some of our readers. As the winter was the time fixed for the expedition Herr Remelé knew that he need not expect to encounter tropical heat; so he determined to take with him the apparatus he had used for many years for landscape photography in Germany, of course taking as a reserve stock, in case of breakages, two plate racks, two porcelain baths, &c.; and equally, of course, the state of the tent-box and camera was carefully tested before they were sent off. The expedition would have furnished new ones; but he considered the old ones better, both on account of his being accustomed to them, and of the wood being thoroughly seasoned. The whole outfit consisted of the tent box and working utensils contained in it, a bundle of tent and tripod rods, three boxes of glass plates, a small box with reserves and workman's tools in case of repairs being required, and the chemical box. The latter had a lid which locked, and the bottles stood in straw envelopes in separate compartments, so isolated that they could be very quickly taken out and replaced. There was not a single bottle in this box broken, though it did not always meet with the most careful handling. The chemicals were all of praiseworthy purity and durableness. The camera was Meagher's new folding one, and for the $8 \times 6$ views he used Steinheil's 14‴ aplanatic lens almost exclusively; but now and then one would be taken with Busch's 15 : 19‴, and for the stereoscopic views Busch's 24‴ portrait lens. The pantascope was of no use, as no object suitable for it turned up. He employed Beyrich's instantaneous collodion with separate iodising, and the results were generally good. Of course, it occasionally got out of order. The other solutions were silver bath corrected, when necessary, with a few drops of glacial acetic acid; for developer and intensifier, protosulphate of iron and ammonia, on account of its stability. Fixing solution, cyanide of potassium. In fine weather the plates were varnished in the sun, at other times in the tent over the spirit lamp.

He left Europe in November and joined the other members of the expedition at Alexandria. From Alexandria they went by rail to Minieh, and from that they sailed up the Nile to Siout. During this first part of the journey it was impossible to take views, as the luggage was all mixed up. On landing the tent box looked a little suspicious, and on being opened it was found that a bottle of silver solution and another of ammonia sulphate of iron were broken, and the contents had run over everything, and even soaked through the box. They were to stay at Siout for a week before the caravan could start, so he cleaned out his tent box, and, as the weather was quiet, seized the opportunity of getting some pretty landscapes in the neighbourhood. We shall give the remainder of Herr Remelé's experiences in our next.

M. Geymet contributes an interesting article to the *Journal de Photographie* on the subject of heliochromy, and gives a *résumé* of the process, as known at present, of producing coloured impressions upon silver plates and upon paper. In the former case the plate, having been polished, is raised to a temperature of about 300 degrees and allowed to cool. Having received a final polish, such as is requisite for a daguerreotype plate, it is attached to the negative pole of a Bunsen's battery of two cells, a copper or platinum wire being connected with the positive pole. The plate is now plunged perpendicularly into a bath composed of—

| | |
|---|---|
| Hydrochloric acid | 1 part, |
| Water | 8 parts, |

filtered through paper. The current is completed by dipping the platinum wire into the solution, retaining it in a position parallel with the plate, moving it at intervals to regulate the deposition of the chloride on the plate. The operation is complete when the surface is covered with a grey film of subchloride of silver. The plate is washed in distilled water without friction, and is then capable of reproducing faithfully the various colours of the spectrum. The process upon paper consists in floating a sheet of salted paper on a bath of—

| | |
|---|---|
| Nitrate of silver | 20 grammes. |
| Distilled water | 100 c.c. |

After drying, the paper is washed—first in distilled and afterwards in ordinary water—and is then left for some minutes in a solution of chloride of tin, ten grammes of the salt to one hundred c.c. of distilled water. This solution, though filtered, retains a slight turbidness, which is, however, of no consequence. When dry the paper is exposed in a pressure-frame until it reaches a deep violet, almost black, colour; it is then plunged into a solution composed of—

| | |
|---|---|
| Saturated solution of sulphate of copper | 20 parts. |
| „ chloride of sodium | 20 „ |
| Distilled water | 120 „ |

This is M. Ed. Becquerel's formula, which may be replaced by that of M. Poitevin, which, however does not give as satisfactory results, though otherwise interesting—

| | |
|---|---|
| Saturated solution of sulphate of copper | 20 parts. |
| „ bichromate of potash | 20 „ |
| Five per cent. solution of chloride potassium | 20 „ |

The paper is then dried and exposed, about a quarter of an hour being necessary in direct sunlight. The progress of the light's action must be carefully watched to avoid over-exposure. The colours thus obtained fade away in a few minutes if exposed to daylight, but will remain for a considerable length of time in a dark place. The tints are said to be much more vivid upon silver plates than upon paper, being in the latter case principally in the body of the paper. The brilliancy of the paper prints is considerably enhanced, especially if viewed as transparencies, by treating the paper with wax or varnish, and being thus protected from atmospheric action are rendered more stable. The tints are also improved in brilliancy by subjecting the paper for some minutes to the action of various acid solutions, hydrofluoric acid possessing the greatest power in this direction, but it is not recommended on account of its dangerous properties.

M. J. F. Plucker, of the Belgian Photographic Association, contributes to the *Bulletin* an ingenious method of producing panoramic prints from two or more negatives. The negatives must be taken so as to include, at the edges where the junction is to be made, a portion of the subject in common. This portion is printed from one of the negatives upon a slip of paper, which is divided in the centre with a penknife. The two halves are then attached to the negatives in such a manner as to exactly cover the portion it is intended to "stop out" of each, a piece of opaque paper, the size of the negatives used, being also gummed on for the purpose of protecting the sensitive paper, which is not covered by the negative. The first negative is placed in a printing-frame large enough to hold the number of negatives intended to be combined, and, after printing, the extremities of the line of junction are carefully marked with a pin point. Negative No. 2 is then introduced and brought into "register" with the pinholes. This may be done either by holding the frame up to the light or by resting it on the edge of a table, a lamp being placed

on the floor. Having secured the register proceed to print in the usual way, repeating the operation for each different negative. Though not strictly in accordance with the laws of panoramic perspective, M. Plucker's method will doubtless prove of use to many amateurs who do not care to incur the expense of a costly instrument for the production of this class of picture.

The same gentleman also communicates his experience with dry bromide plates prepared with the bath, the preservative consisting of tannin, gallic acid, and dextrine, the development being effected by the alkaline method, both weak and strong. The results appear to have given entire satisfaction, but the details possess little novelty for English readers. We notice, however, that M. Plucker recommends a backing of lampblack, and says, in connection, that it cannot be replaced by coloured paper or cloth, as is done by many operators in this country. In support of this he deduces the following experiment:—Cover one-half of a clean glass with the black colouring, and, having furnished yourself with a sheet of printed matter or an engraving, place yourself in such a position before a window as to obtain by reflection an image of the print or engraving on the surface of the glass. It will be noticed that while the image reflected by the coloured portion of the plate is perfectly clear, the lines reflected from the uncoloured portion are confused and double. This doubling of the image does not disappear if the backing consist of cloth or paper. Perhaps M. Plucker neglected to moisten the material used, and thus failed to secure optical contact.

In a recent number of the *Bulletin de la Société Francaise* M. Noel gives formulæ for a new developer and redeveloper, the only point of difference consisting in the substitution of methylic for pure alcohol. The result is stated to be an immense increase in developing power; for, whereas with the ordinary solutions the exposure necessary for the production of a portrait ranged from forty-three to fifty-eight seconds, with the new methylic solutions the time was decreased to ten, eight, six, and even four seconds, all other conditions being similar in each case.

The *Annalen der Chemie* contains an interesting account of some experiments by M. Marchand on the comparative intensity of light in the different months. From M. Marchand's figures it appears that the photographic season extends from the commencement of April to the end of September, the remaining months being singularly deficient in actinism. December is, of course, at the bottom of the list, the highest point being reached in July. It would be interesting to compare these results with those of the late Mr. Petschler, published some years ago.

M. Rodriguez is attempting to substitute zinc for paper in the well-known process for making photolithographic transfers. He takes a sheet of zinc as thin as possible, which is rolled on a lithographic stone, previously greased and dusted with pumice powder. The plate is then dipped in a solution of soda or potash, washed and covered with a thin coating of bichromated gelatine. This is dried rapidly over a gas flame to avoid crystallisation of the bichromate, and exposed for from five to ten minutes in sunlight. The image, washed in cold water, is inked in the usual manner, and is then ready for transfer to the stone. Superior fineness in the details and correctness in the lines are said to be the advantages gained.

The Paris correspondent of the *Bulletin Belge*, in speaking of Dr. Schaeb's apparatus for outdoor work exhibited at the last meeting of the Photographic Society of France by M. Audouin, mentions that a friend of his who uses a Dubroni apparatus recently experienced a difficulty which for some time completely baffled all attempts at solution. After developing two or three plates it was found that the exposure required to be more than doubled. The silver bath, developer, collodion, &c., were carefully examined, but no light was thrown on the cause of the trouble, when, on the point of giving up the search in despair, it struck him that the vapour of the acetic acid of the developer remaining in the chamber of the apparatus had the effect of retarding the development of subsequent plates. A thorough ventilation of the apparatus after each negative proved a complete cure, and now a fixed acid (preferably citric or tartaric) is substituted for the acetic.

M. Jaubert, of Marseilles, introduces one per cent. of powdered sugar into his collodion for the purpose of keeping the plates moist for some time after leaving the bath. The sugar is also said to increase the sensitiveness, and does not disorder the bath.

The following new formula—a modification of M. Poitevin's process with chloride of iron and tartaric acid—is recommended by M. Obernetter for the reproduction of negatives by the "dusting-on" method, the manipulations being similar to the now well-known bichromated gum process:—

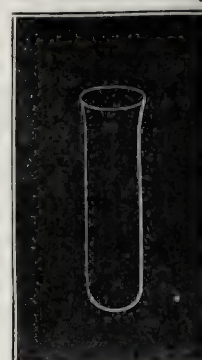
| | |
|---|---|
| Citrate of iron | 10 grammes. |
| Citric acid | 5 ,, |
| Sesquioxide of iron in concentrated solution | 2 ,, |
| Water | 100 c.c. |

## ON THE USE OF PHOTOGRAPHIC AND CHEMICAL APPARATUS.

### CHAP. XI.—ON MISCELLANEOUS APPARATUS.

Test Tubes.—The most important of the various utensils required for the application of tests have been referred to under their several headings in the course of this series; there still, however, remain some useful ones to be described, first and most important of which are test tubes.

These little vessels are of more general use than any in the operating chamber, which should be supplied with a variety of them in various sizes; they are usually sold in nests containing half-a-dozen or more, and ranging in size from an eighth of an inch to nearly two inches in diameter, and from two inches to more than half a foot in length. They are simply pieces of thin glass tube closed at one end to enable them to hold liquids, &c. Those made of hard Bohemian glass should be chosen, and not by any means the soft, white flint-glass ones, which give way directly heat is applied when the contents are dry. A common form of the tube is here shown. They are also made both narrower and wider in proportion to their length. A well-made tube should be even and regular in shape, having a slightly-flanged mouth, which strengthens it and assists in the fitting of corks, and the bottom should be well and evenly rounded and free from any irregularity or lump, the latter being frequently seen in ill-formed tubes. They are useful under most varied circumstances, by turns taking the place of flasks, retorts, condensers, evaporating dishes, &c., &c., their small size, combined with the ready access to the contents their shape affords, rendering them of great use for small operations.



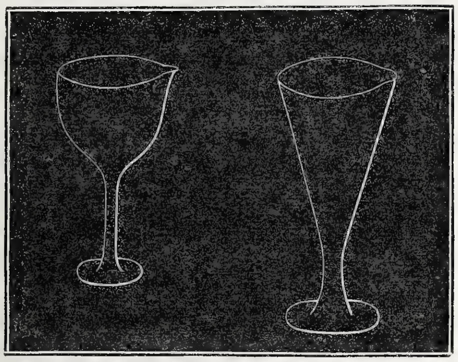
Details already given with regard to the use of flasks, &c., are equally applicable to test tubes. When held in a gas flame for boiling they should be kept in a slanting position with the object of arresting upon the sides any particles that might be mechanically carried away with the vapour; if the mouth be turned away from the operator he will be rendered safe from the risk of injury through any sudden projection of the contents of the tube.

When it is not convenient to use a holder during ebullition (the tube soon getting hot the whole of its length), the fingers may still be preserved from burning by placing the forefinger over the mouth of the tube a moment after ebullition commences and vapour begins to escape; a portion of air is then retained, which forms a sort of cushion against the steam and does not get quickly heated. The application of heat may be regulated by the pressure felt by the finger closing the tube. This plan also enables one readily to subject the fluid under operation to a greater heat than that of its boiling point, as by reason of the pressure the boiling point is raised. After removing the source of heat especial care must be taken not to withdraw the finger until a few seconds have elapsed, or the whole of the fluid would be ejected, owing to the sudden formation of steam. The tube when in use would, however, oftenest be held by a holder or clip. There is a very large variety of these made, for standing by themselves, for holding in the hand, or for attaching to retort stands; and the latter are so constructed as to allow the tube to be placed at any angle.

For holding tubes when not in use, or for supporting them in an upright position when testing, frame supports are made, capable of containing a large number at once. They consist either of a shelf pierced with holes attached to a base, the tubes being placed mouth upwards in them, or of a series of stoneware or wooden pegs fixed upon a base, the tubes being slipped, mouth downward, over the pegs. This latter form is the more useful, as the tubes can be placed to drain directly after washing with perfect freedom from contamination with dust. The two forms combined in one can also be obtained. This is, perhaps, the most serviceable of all. An equally useful extemporised apparatus can be formed from a small vessel of sand in which the tubes can be placed, or over strips of wood inserted

into it. A test tube should never be put away dirty; their cost is so slight that the student is too apt to think it "not worth the trouble" of cleaning, and so habits of carelessness are easily engendered.

*Test Glasses, &c.*—The mixing together of various tests and reagents in a liquid form with the substances under examination being one of the chief means used for ascertaining the composition of the bodies a suitable collection of utensils for the purpose is necessary. They are, however, simple in form—test glasses and test slabs to receive the tests, &c., and pipettes or their substitutes to convey them, being all the additional apparatus necessary. A plentiful supply of test glasses will be needed, as it is generally



needful to use several for one operation. They are made in a great variety of shapes, the two figured being leading kinds, the one with stem, known as "Clarke's," being generally preferred. They should be selected of hard glass, Bohemian or German, the English white flint being soft and soon scratched till they become almost opaque by the use of the stirring rod.

When adding a reagent to a liquid for the purpose of precipitation it becomes a matter of considerable nicety to determine the exact point when complete precipitation is reached. To ascertain this it is necessary from time to time to abstract a clear portion of the liquid and try it. When the quantity operated upon is very small, this will be best done by means of a decanting tube—a piece of quill tube quite smooth and even at one end—which should be applied so as just to touch the surface of the liquid without dipping into it. A small quantity of the liquid will then rise by capillary attraction into the tube, out of which it should be discharged into a testing slab—a piece of white porcelain, with a number of shallow depressions or wells—in which minute portions of the testing fluid have been previously placed by a glass rod. With coloured precipitates the point when no further deposit is produced will be readily seen, and the liquid under treatment will be lessened in quantity by an inappreciable amount. When large quantities may be withdrawn, or when the previous process is inapplicable through the precipitate not having subsided sufficiently, a portion of the clear solution will be most readily obtained by taking a wider decanting tube, having first tied over its end a piece of filtering-paper, protected by muslin and wetted with distilled water, dipping it into the turbid liquid. A quantity of fluid rendered clear by the paper will rise in the tube, whence it may readily be transferred to another test glass, and the progress of the precipitation observed. The use of the pipette in this connection has already been adverted to.

*Supports.*—The various supports required for the larger apparatus have already been referred to; there are, however, sundry other useful ones of simpler forms which should not be lost sight of. For flasks with round bottoms a useful support is a piece of stoneware with a rounded cavity which receives the flask and prevents its falling over. Hot flasks should never be put down on the table, as it would subject them to the risk of breakage; a wisp of straw neatly tied round with string into the shape of a ring forms a most useful and convenient support for them while cooling. Thermometers are supported in liquids by inserting them to the requisite depth through a piece of cork, the whole then floating upon the surface. For the immense variety of supports required for sundry purposes the student will do best to refer to the dealers' catalogues.

G. Watmough Webster, F.C S.

## OUR CLUB.

### No. III.—The "Secret" Man.

A few weeks ago, as I sat in my little back room touching up some negatives, my plate-cleaner appeared and announced that a gentleman wanted to see me. "All right," I said, without raising my head until I heard the approach of the visitor's footsteps. I laid down my pencil, and, rising, awaited his entrance, when a rather old-looking personage, very upright in his gait and with hat in hand, made his appearance.

"Good morning," he said, with great formality. "Keep your seat, sir; don't let me disturb you, pray;" and with a flourish of his hand he drew a chair towards himself, and, sitting down, made himself quite at home.

As I sat wondering what could be his business, I took a portrait of him in my mind's eye. He was a thin, spare, upright man, with a few grey curls like a fringe around his head, the top rising smooth and polished like a mahogany table; an upturned nose, self-satisfied lips, and uneasy, twinkling, grey eyes. He had on a dark coat and trousers, patent leather shoes, and a light fawn-coloured tie. He was very well "put on," and yet he looked shabby. There is a class of men who, though you dressed them in the best the world could produce, would still look mean and shabby; they seem to hold it as a birthright. *My* visitor looked one of this caste. So thought I, as I sat looking at him while he continued rubbing his hands the one over the other, and smiling as if he were on very friendly terms with himself.

"A very nice place you have here, sir," he remarked with a smile.

"Pretty fair," I ventured to reply.

"One of the nicest places I have seen, sir, and I have seen a few places in my time."

"Travelled a deal?" I asked.

"I have sailed all round the world, sir. I have heard the mocking bird singing in his native clime; I have heard the lion roaring in his native tongue."

"Oh! this man travels with a circus or a menagerie," I thought; but assuming an air of astonishment I exclaimed, "Indeed!"

"Yes, sir; and again I say this is a very nice place of yours." I bowed.

"Do you see that?" he said, holding up his foot with the patent leather shoe and bending it backwards and forwards. "It's not many men could do that," he remarked, with a self-satisfied expression lighting up his face.

"No!" I replied.

"I see you wear—excuse me for the liberty I take—you wear elastic-side boots. They are bad for you, sir. They will injure your feet; your feet will injure your legs; your legs will injure your spine; your spine will affect your brain. Take care of your health."

"A quack doctor," I thought; "what does he want here?"

"You are a stout man, sir. Are your family inclined to be stout?"

"Yes, a little," I replied, with a smile.

Then he rose, and coming forward tapped me all over the chest with his fingers, and, looking serious, he remarked—"Too much fatty matter here and here and here," his fingers travelling over my manly bosom the while. Then came the startling announcement—"By and by it will get up to your throat and choke you."

"I'll risk the choking," I said, with a laugh.

"You may laugh, Mr. Oute," he continued seriously; "but if ever you should meet me—say ten years hence—you will say, 'Major Brown! a thousand thanks for the invaluable advice you tendered me that time we met ten years ago. Sir, you saved my life.'"

"A considerable time to look forward to," I ventured to hint.

"Pooh, pooh! sir. 'Time was made for slaves!' not for the sons of freedom."

"My sentiments exactly."

"Thanks. I'm glad you agree with me. As I was observing—no need to take medicine; 'throw physic to the dogs.' Movement, exercise, the working of the legs and arms, the full play of the muscles, gliding on to the ever-floating sounds of heavenly music. Movement and music are the great charmers, sir, of a perfect life."

I thought—"This man's a conundrum; but I've hit it this time—he's a dancing master."—"What kind of music would you say for a headache now?" I asked, pulling a serious face. "Would it be a trombone or a French horn, to be taken say three times a day?"

"This on your part is pleasantry, sir," he said with a majestic wave of his hand; "but to business. I have called upon you to see if you will be so good as give me an introduction to the photographic club of which you are an honourable member. I and a friend of mine are on a tour and carry with us a new thing in the art-science that will be the means of making the fortunes of all those who buy it. I say this, sir, without fear of contradiction."

"By Jove! a process-monger!" I exclaimed.

"Sir, you are rude," he said, in a depreciating tone; "but I forgive you, sir, I forgive you. But to come to the point. If you will be so good as to introduce my friend and me to your club, I doubt not but it will be interesting to you."

"And profitable to you," I thought; but, feeling sure that we would at least have some fun out of my eccentric friend, I promised.

"Many thanks," he said, grasping my hand, "I will be with you anon;" and, with a dramatic bow, he withdrew. Mark Oute.

## THE POSITIVE BATH FOR ALBUMEN PAPER.*

To prepare the paper so that it will become sensitive to the light it is necessary to float it upon a *positive* nitrate of silver bath—so called on

* From the *Practical Printer.*

account of its being the means by which the paper is enabled to receive the positive impression from the negative. This bath is chiefly composed of crystal nitrate of silver and pure water. The strength should vary according to the temperature of the weather and the brand of the paper used. Mr. John R. Clemons recommends for his brand of albumen paper a bath of thirty grains of nitrate of silver to the ounce of water for summer and forty-eight grains for winter, besides varying the time of floating the paper according to the time of the year.

In the year 1871 there was considerable discussion in the leading photographic publications as to whether a strong or a weak bath was best for printing. Many of the leading photographers were in favour of a strong bath, and about as many more in favour of a weak one. It might be supposed that a weak silver bath would necessitate a longer time for floating than a strong bath would, and also that a bath weak in the number of grains of silver to the ounce of water would be more economical. This is a mistake. When a sheet of salted albumen paper is floated upon a bath of nitrate of silver the salt in the albumen will take up the silver which it needs, whether the bath be a strong or a weak one, and chloride of silver will be formed. The albumen will also take up some in the form of albuminate of silver (Vogel's *Handbook);* and then, if the sheet be allowed to remain on the bath too long a time, there will be more of the solution absorbed than is really necessary, which will penetrate through the surface and far into the albumen. The paper thus floated and printed will have a "sunk-in" appearance, owing to the silver discolouring, which is absorbed far into the albumen, as before stated, during the lengthened time of sensitising. This "sunk-in" appearance is not the only fault of long floating on a weak bath. The albumen will be dissolved off, being left in the bath, the paper will not print brilliant but dull, and often flat prints will be the result.

A strong bath necessitates a long time of floating, because the albumen on the paper is at first coagulated by the strong silver solution, and it takes quite a number of seconds for the albumen to commence to take up what silver it needs; whereas the albumen on the paper, not being coagulated by the silver in a weak bath, will more readily absorb that silver which is necessary for the production of a good print. From this we find—First, that a strong silver bath requires a long time of floating; second, that a weak silver bath requires a short time of floating; and, third, that a medium silver bath requires a medium time of floating.

There are, however, bad results obtainable by floating the paper a long time on a strong bath, as well as floating a short time on a weak bath. When we float it a long time on a strong bath it will, when printed, make a bold and brilliant print, but the shadows will be very much bronzed, even when the prints are mounted. When we float the paper a short time on a weak bath it will not be at all bronzed, but the prints are likely to be weak; and, on the other hand, if we float the paper a long time on this kind of bath the silver will be, as has been said, sunk in, or, as it is sometimes expressed, the paper will be "woolly."

I do not mean by the first two remarks made above that the extremes are to be indulged in; for then in a measure arises the bad results named, and in the case of the weak bath the abuse of the remark will be more especially a source of failure. We cannot, to obtain good results, use a bath weaker than thirty-five grains, or stronger than sixty grains of silver to the ounce of water, with many of the brands of paper which are generally used, while with other brands thirty grains in summer and sixty to seventy grains in winter are best. For the excellent brand of paper known as the "Berlin" I found with the class of negatives I printed when using that paper that a medium strong bath—say of forty grains in summer and fifty-five to sixty grains in winter of nitrate of silver to the ounce of water—was best; while with the "Hovey" brand of paper a bath of not more than thirty-three grains, or less than twenty-eight grains of silver to the ounce of water, with twenty-five seconds' floating, was necessary in the summer. In the winter, when the negatives are printed on the roof, I have known of a bath of seventy grains of *silver alone*, and from two to three minutes' floating, to be required to obtain good prints from the *very thin* negatives that were made.

A weak bath loses so much, after silvering a dozen sheets or so, that it commences to make itself felt, and consequently needs strengthening about all of the time. A strong bath loses also, but the silver is not taken up in so large a proportion as it is in the weak bath, and the strong bath can be used for a much longer time, even until there will not be enough solution to sensitise the paper, without giving the printer any trouble whatever. The prints will be better in many respects with an average bath than with either the extremes, as a trial will show to the observant printer. All the solution on the paper should be, as much as possible, on the *surface* of the albumen, to prevent "woolliness," and so as to have bold, vigorous prints; which can be *easily freed* from the nitrate of silver in the washing.

In the making of the bath good nitrate of silver and water are required. In all cases where pure water is required filtered rain or clean ice-water will answer. To make a bath of sixty ounces of solution, and forty grains strong of nitrate of silver to the ounce, the number of grains of silver required would be 2,400 grains, or five ounces. Take a large wide-mouth bottle and add sixty ounces of pure water thereto. Now carefully weigh out five ounces of good nitrate of silver and add it to the water in the bottle. Dissolve thoroughly, by repeated shakings of the contents of the bottle, which is very easily done without spilling the liquid, by holding the top of the bottle firmly with the left hand and revolving the bottom in a circular motion, in a steady and even manner, with the right. This bath is called "plain nitrate of silver bath," because of its being composed simply of nitrate of silver and water. This bath is used by a great many excellent photographers throughout the country, except that the strength of it differs, sometimes being greater and then again often less than the strength given above.

Mr. H. T. Anthony, of New York, was the first to advise the use of alum in the printing-bath, and since the discovery of it for that purpose it has become quite universally used. It is, indeed, the best thing that can be added to the bath to give brilliancy and richness of tone to the prints. The theory of the alum as being an improvement when used in the printing-bath is as follows:—The alum hardens the surface of the albumen paper when it is floated upon a silver bath containing it, so that the solution is kept more on the surface; and when the paper is quickly dried the resulting prints appear very brilliant, printing finely, especially in the shadows, and are more easily and better toned and fixed, and the final washing is more likely to be thoroughly done. A small lump of alum is placed in the funnel through which the bath is filtered, and the solution, as it filters, will take up the quantity it needs.

Mr. John R. Clemons has recommended the use of glycerine in the printing-bath, in the proportion of an ounce and a-half of pure glycerine to every sixteen ounces of solution. It has been used most successfully by many photographers, and it is especially a good thing for his brand of paper when it is floated for one minute on a bath of thirty grains (during the summer) of nitrate of silver to the ounce of water.

Sal soda is often added to the silver bath in the proportion of an ounce of the saturated solution of the soda to a bath of sixty ounces. On adding this the bath will immediately turn milky. After the solution has been thoroughly stirred it should be allowed to settle for a while, and then filtered into another bottle before use, leaving the carbonate of silver (the deposit) in the first bottle. When through silvering the paper pour the solution back into the bottle where the deposit is and again shake the contents. In the morning the solution will be thoroughly clear, although the bath may have been very much discoloured when it was poured into the bottle the night before. Always let a sediment be in the bottle, and every other day add a few drops of the soda solution to the bath. Keep on adding solution made up as above. A few ounces of the solution should be added to the printing-bath every night after use, so as to keep the quantity up to a certain number of ounces.

I have used a bath prepared as above for eight months, and, although the bath when poured from the silvering-dish at night was often as black as a coal, it never failed to be clear in the morning, if there were a sediment at the bottom of the bottle.

Citric acid is also sometimes added to the printing-bath, in a greater or less degree, according to the time the paper is required to be kept, for this is principally the reason why the acid is added. When the paper is only required to be kept a day or so after sensitising, so as to prevent it from turning yellow by being kept over-night, on account of a sudden storm, &c., the solution is made a *very little acid*, viz., a few drops of a solution of citric acid twenty grains, water one ounce. If the paper is desired to be kept white for a longer time than a couple of days, then more of the acid should be added. Fume fifteen minutes. The paper will print a little red, but it will most probably be very rich, although this will be according to the quality of the negatives, &c. The citric acid printing-bath should be tested every morning before using it, to ascertain the *degree* of acidity. Never let your bath be acid with *nitric acid* unless it be *very, very slightly so,* as the prints, besides being of a poor (photographically considered) red colour, are very liable to be *weak* and *flat*.

Nitrate of ammonia is very often added to the printing-bath in the proportion of as many grains of the nitrate to the ounce of water as there may have been grains of nitrate of silver added. After adding the nitrate of ammonia to the printing-bath make *slightly alkaline* with liquor ammonia. Sunning the bath for about half-an-hour or so after the nitrate of ammonia has been added and the solution made alkaline is a good plan. Filter before use. I will here give a few formulæ for baths for printing which I have used and know to be excellent:—

No. 1.

| | |
|---|---|
| Crystal nitrate of silver | 40 grains, |
| Nitrate of ammonia | 35 ,, |
| Filtered rain-water | 1 ounce, |
| Saturated solution bicarbonate of soda, about | 8 to 10 drops, |

or enough to make the bath *slightly alkaline*. In place of the sodium liquor ammonia can be used equally well. Make up a sufficient quantity, and before filtering through *cotton* place a lump of alum in the funnel about quarter the size of an ordinary butternut. The above bath is for summer use; in the winter both the nitrates should be increased.

No. 2.

| | |
|---|---|
| Nitrate of silver | $2\frac{1}{2}$ ounces. |
| Nitrate of soda | 2 ,, |
| Glycerine | 3 ,, |
| Pure water | 40 ,, |

Make it a little alkaline with aqua ammonia. This bath is very good for the "Clemons" brand of paper, and can be used also with the "Hovey" brand; but a bath made as below is better for the latter paper:—

No. 3.

| | |
|---|---|
| Nitrate of silver | 30 grains. |
| Nitrate of ammonia | 30 ,, |
| Pure water | 1 ounce. |

Make it a *little* alkaline with aqua ammonia, and when about to filter the solution place a small lump of common alum in the funnel, or, if you prefer, add a grain of the alum to every ounce of the solution. The latter is probably the best. The alum, if added in this way, should be added before the bath is filtered. Float the paper, being sure that it is a *little damp* beforehand, from twenty to thirty seconds. Draw over a rod, and blot off the superfluous quantity of silver that is still on the paper between large sheets of white bibulous paper. Dry quickly and thoroughly, and fume ten minutes.

The foreging formulæ and modes of working are for summer use. For winter the temperature of the solution should not be below fifty degrees, and the strength of the nitrates should be increased as well as the time of floating. Print, in the winter, in the printing-room under glass, and keep the temperature of the room not below fifty or above sixty degrees.

There are some photographers who prefer an *acid* positive bath to an alkaline or a neutral one, because the resulting prints are red, and the red tone is more easily obtained (?)—so they say. If the bath be acid with *nitric* acid the result will not be so fine as it would be if it were acid with citric acid, because if the bath were any more than *very slightly* acid with the nitric the paper floated upon it when printed will have, as above said, a disagreeable red tone, often being weak and flat. The best results are obtainable with a bath which is either a trifle alkaline or just neutral. A good way to regulate the alkalinity of the printing-bath is to observe how the paper prints, and then act accordingly. If it print too blue a drop or so of nitric acid should be added to the bath; if it print too red then add a few drops of liquor ammonia. In testing this way, however, the printer should be sure that the paper is properly fumed, and that the results are not occasioned by poor judgment in fuming. Place a piece of blue litmus paper in the solution before you commence to "doctor" the bath, and note the exact colour it turns.

*Nitric acid should always be added to the positive bath when it is not desired to make the solution acid for the purpose of printing, but only to lessen the alkalinity of the bath.*

### Rectifying the Positive Bath.

The bath, after it has been used for some time, discolours, owing to the albumen of the paper being left in it after floating, or dirt and other impurities having got into it through accident, leaving the dish uncovered when the bath was not in use, imperfect filtrations, and chemical matter which was impure, and by age having shown itself.

*Permanganate of Potash.*—When the bath is only a little discoloured, and is a new one, this solution will for a while answer capitally:—

| | |
|---|---|
| Permanganate of potash | 60 grains. |
| Pure water | 6 ounces. |

Add about half-a-dozen drops, and stir the solution with a clean glass rod. At first the bath will turn a dark rose colour, and it will then considerably lighten, and if it do not stay so, but utterly disappears, then add a few drops more until a temporary colour appears. Now place the bath out in strong sunlight for half-an-hour, and after it has thoroughly cleared and the rose colour has disappeared the organic matter can in a great measure be filtered out.

Mr. Elbert Anderson, in his book, *The Skylight and the Dark Room*, accounts for the action of the permanganate as follows:—"As soon as the permanganate comes in contact with the bath the organic matter becomes oxidised, and permanganic acid is liberated, forming permanganate of silver, which remains in the bath, and is precipitated to the bottom in dark, brownish-black flakes, whilst the permanganate itself is converted into peroxide of manganese. As soon as the solution is perfectly clear most of the organic matter will be filtered out. Thus the permanganate precipitates most of the organic matter without the least injury to the bath."

*Kaolin.*—This is often used for clearing up the printing-bath. A little of this powder is placed in the bottle containing the discoloured bath, the solution thoroughly stirred with a glass rod, and then allowed to settle for the space of a few minutes. Filter the *decanted* solution through cotton, and at night pour the bath again into the bottle containing the kaolin. Thus the same kaolin can be used for a great number of times.

Mr. F. A. Bridge, in the *Year-Book* for 1873, recommends for those printers who use the kaolin a simple apparatus described as follows:—"Take a large, wide-mouthed bottle (depending upon the quantity of solution you have in use), fit a cork to it, and bore three holes in it—one large enough to admit the point of a funnel going well through the other side, and the other two large enough for a piece of ordinary glass tube. Bend a piece of tube in the form of a syphon; let one end reach to within about an inch of the bottom of the bottle, and let the other end be a few inches longer. Break it off below the turn in the *longest* side, and join it together again by means of a piece of india-rubber tubing about two inches long. Put another piece of glass tube (slightly bent for convenience sake) just through the cork, and the thing is made. Put some kaolin in the bottle, and after using the solution return it to the bottle through the funnel over night and shake it; it will be quite clear by the morning. When again required for use you have only to cover the top of the funnel, put the long end of the syphon in the dish, blow gently down the short tube, and the syphon immediately commences to act, and continues to do so while there is any solution to supply it; and, if care be taken to stop it before the top of the solution reaches the level of the syphon-tube (which may be done at any time by pressing the piece of india-rubber tube), no scum will ever get into the dish."

*Gum Camphor Solution.*—When the bath is very much discoloured this rectifier is most generally used. It is made as follows:—

| | |
|---|---|
| Gum camphor | 1 ounce. |
| Alcohol (95 per cent.) | 6 ounces. |

Add about four drachms of this solution to the discoloured bath and shake well. Probably the froth which is at first formed will disappear, and then it will be necessary to add another equal quantity, if not more. Shake well, and then allow the bottle to stand for a few minutes. Filter the solution through paper; the albumen, which united with the camphor, will be left in the filter, and the bath will be very clear.

*Boiling Down the Solution.*—About once a month or so the printing-bath should be boiled down about two-thirds. It is first made very alkaline with aqua ammonia, and is then placed in an evaporating-dish over a small gas stove, and a small jet of gas turned on. When it has boiled down two-thirds turn off the gas, and permit the solution to cool gradually, leaving the dish on the stove in the meantime. When cool filter through paper, and test the strength of the silver by means of Pile's test-tube and solution. Add water to reduce the bath to that strength which is best for the paper, negatives, &c.; then add the other nitrates (or whatever other chemicals which may have been used in the making of the bath in the first place) to the bath; *see to the alkalinity*, filter, and the bath will be ready for use.

*Fusing the Bath.*—Place the bath in a suitably-sized evaporating-dish, and boil down to dryness at a gentle heat. Scrape the silver which has adhered to the sides of the dish down to the bottom, and stir the solution with a glass rod until all the bubbling has ceased. Now turn off the gas jet, and stir the mass constantly with a glass rod until it has cooled, and then the mass will be broken up, which is a more desirable state to have it in. In an hour or so after you have left off stirring it you can dilute the strength of the fused mass by the addition of pure water. Reduce to the proper strength for the printing-bath, and then filter the solution. The organic matter will be left in the filter. Now make up your bath as has before been advised, and then it is ready for use.

*Sunning the Bath.*—The bath is made alkaline and placed out in the sunlight, for the purpose of throwing down the organic matter in it. The bath is very much improved by sunning, and it should always be placed out in the light when not in use. To prevent evaporation keep the bottle tightly closed.

*Filtering the Bath.*—This can be done either by means of common filtering-paper or through cotton. Good filtering-paper can be obtained from almost any stockdealer, of various sizes, all prepared for immediate use. Sometimes the filtering-paper is rendered useless on account of there being traces of hyposulphite of soda in it; but this is very seldom the case. If you have a filtering-paper of which you are suspicious you can test it by the following simple method:—Take a sheet of the suspected lot of paper and place it in a small and perfectly clean evaporating-dish, in which there has been placed a small quantity of warm distilled water—say five ounces. Cover the dish over with a glass and let the paper soak for a few hours; then *boil* the water, with the paper still in it, for the space of half-an-hour. Take a clean test-tube and squeeze about an ounce of the water from the wet paper into it. This should be done with *perfectly clean hands.* Now dissolve about five grains of permanganate of potash in about an ounce of distilled water, and then add ten grains of bicarbonate of soda to it. When this solution is thoroughly dissolved and mixed let fall about three drops of it into the test-tube containing the water squeezed from the filtering-paper. If there be a trace of the hyposulphite in the water the liquid in the test-tube will turn a more or less *greenish tint*, according to the quantity of the soda there may be in the solution. Look sharp. If there be no hyposulphite there the rich colour of the test solution will not be lost, although its deepness may be weakened. When the latter is the case the filtering-paper has nothing in its composition that will be at all injurious to the bath when filtered through it.

When preparing to filter your bath solution through paper the latter should be folded in six or eight places, so as to permit the air from the bottle to escape between the folds of the paper, thus allowing the solution to filter quicker. In folding be careful that you do not break the centre of the sheet of filtering-paper where the folds meet. The paper should be placed in the funnel, and when the solution is poured into it to be filtered it should be poured at the side of it, slowly at first, so that the weight of the solution will not be likely to break the filter.

When it is desired to filter the bath through cotton the latter should be wet thoroughly with good, common alcohol and thrown into the

funnel. Now pour the solution in and filter the bath. If it filter too quickly—that is, imperfectly—then press the cotton down further in the neck of the funnel; if too slowly, then place the glass rod in the centre of the filter, turn it round once or twice, so as to catch hold of the cotton, and then pull it very slightly.

## Correspondence.

THE LATE THOMAS SUTTON.—NOVEL MEANS OF TAKING THE CURVES OF THE WAVES.—PHOTOGRAPHY AND PHOTOGRAPHERS.—EXHIBITION OF 1875 AT PARIS.—A DESIDERATUM FOR INVENTORS.

MR. THOMAS SUTTON is no more! Such was the sad tidings which reached Paris last week. It is with deep sorrow that I commence my communication of today with the mournful subject of the untimely death of that much respected gentleman. Mr. Sutton has won a distinguished and well-known name among continental as well as among English photographers. His death has not only bereaved his family and friends, but occasioned a great loss to science. By the clear and intelligent manner in which he wrote on photographic subjects he won the esteem and the friendship of his readers, who saw clearly that the chief object he had in view was the advancement of an art to which he had devoted much time and study. As to his private virtues I must leave the description to those who were personally acquainted with him; but we have had the proof that the sentiment of honour and of friendship was predominant in his actions, for, to his praise be it said, he risked his reputation as a well-informed writer on a promise made to a friend in Paris. This unhappy promise has caused a great loss of valuable time in a recent discussion, putting on the rack, as it were, two men no longer able to defend themselves. We must impute it to the kindness of heart of Mr. Sutton that he endeavoured to serve a friend who it is certain had imposed on his good faith; for no one would for a moment believe that he had the intention of tarnishing the glory attached to the name of a countryman and a man of genius, as was Archer.

Since the discussion was opened on the subject as to whether we were indebted to Archer or to Bingham for collodion, I have had time to make inquiries among my friends who personally knew Mr. Bingham, and they have informed me that they always heard him introduced into society as the inventor of collodion, and to their knowledge he had never corrected this error or declined the title. This will appear strange to those who live on the other side of the channel, but it is not so to one who resides in this gay city. French politeness, mixed up with a little *orgueil*, very often causes French hosts to give a high-sounding title to their guests in introducing them one to the other, to enhance, as it were, the honour of receiving a circle of great men. One of my friends observed that if he were presented in any house as the King of the Cannibal Islands or as the Prince of Wales he would never take the trouble to refute the error. This is what probably happened to Mr. Bingham; he was introduced to a family with the title of *collaborateur* in the discovery of collodion, another family gave him the honour of the invention, and thus for several years he was continually introduced from one to the other with that title, so that but a little imagination was wanting to make him believe he was so in reality. It is sad, indeed, to call up men from the cold grave to "speak" of their failings. It is a well-known fact in Paris that after the death of his wife Mr. Bingham's mind became much deranged. It might have been at this period that Mr. Sutton paid him a visit, and, carried away by the *prestige* which previously attached to Mr. Bingham's name, paid more attention to the reverie of a man upon whom the hand of death was stamped, and whose powers of reasoning were already dimmed, than should have been done without more reflection; for the statements which were made were quite untenable, as has been proved in the late controversy, and even more has been borne out in writings published by Bingham himself.

Now that our esteemed friend Mr. Sutton has gone to rejoin the others in another world, it is our duty to show how and in what manner his good faith was imposed upon; for no one having his understanding would for a moment have risked his reputation without having a firm conviction in the honour and integrity of a friend. This sacrifice to friendship speaks more highly in the praise of our departed friend than volumes could do. Mr. Sutton is taken from us, and the Angel of Death, who has recently appeared to prefer noble victims, has too rapidly mown him down; nevertheless, in his short career he found time to be of service to his fellow-creatures. "*Requiescat in pace!*"

The Academy of Sciences has received a very interesting communication from M. Huet as to his system of writing or drawing, by means of light, the curves formed by a ship when tossed about by the waves. He places his *camera obscura* perpendicular to the ship's axis, and the lens is focussed on the line of horizon. A dry plate is placed in the dark slide, the latter being slowly kept in motion by means of clockwork. The image taken up by the lens passes through a small slit, and thence to the plate. The rougher the sea the greater will be the number of zigzags formed on the plate during its transit across the apparatus. No doubt this idea will render great service to science in furnishing the means whereby the length and depth of the waves of the different oceans and seas can be calculated.

Are photographers in a better position than they were a few years ago? or can it be said that the golden age has arrived for them? These were the questions I asked myself last Saturday week on the occasion of a *fête* given by M. Liebert in his new photographic establishment situated in the Rue des Londres. Photographers no longer content themselves with a covered garret as a studio; they now build themselves palaces—if I may be permitted that expression—in which they receive the applause of their courtiers and the congratulation of their friends, surrounded by everything that money can purchase to enhance the splendour of their abodes, gratify their opulent *clientèle*, and attract the public. Indeed, great praise is due to such men as M.M. Adam-Solomon, Nadar, Franck, Walery, Liebert, and others, for having succeeded in surrounding photography with a certain artistic *prestige*. We may say, indeed, that honour is due to Mr. Bingham for this revolution in the *bien être* of photographers, by creating in this city saloons in which royalty itself did not disdain to sit for their portraits. Yes! photographers are richer than they were formerly, because they are superior men. Photography has been a great teacher, and has given the general public an artistic taste which, only a few years back, was impossible for all but the wealthy. This artistic taste has rendered the public more discriminating, and not only so, but better able to judge of the value of a portrait; hence inferior men have been thrown out of the ring and obliged to seek other occupations more suitable to their qualifications, leaving superior men full scope to show what photography is capable of when directed by artists of skill and culture. Thus difficulties in manipulation and a change in public opinion and public taste have placed on a par the photographer and the painter. It followed, naturally, that the photographer being no longer looked upon as a would-be artist many superior men entered the photographic ranks, and, aided by amateurs as well as by its journals, photography has been brought to that state of perfection which it occupies at the present day. The time is, happily for all, gone past when the *employé* of an amateur or photographer could learn in a few days the composition of a silver bath and how to make a little collodion, in order to establish himself in a market or fair as the "celebrated artist," &c., &c., make positives on glass, and gain a living. What a difference between his productions and the splendid *cartes de visite* now sent out by the best houses! 'Tis true the remuneration is not the same; for fifty francs a dozen, and even more, is now paid to the artist, while formerly the sitter bargained with the photographer when the latter asked him or her the exorbitant price of five francs per dozen.

An Exhibition will be opened at Paris from the 10th of July to the 15th of November, in the Palais de l'Industrie au Champs-Elysées, in which photography will have a place. I hope that this Exhibition will induce many of the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY to come to Paris and visit some of the best establishments here, where I am certain they would be received in a genial manner. Thus would be carried on the friendly intercourse which should exist between the two countries.

Would it not be well to create and sustain a friendly tribunal before which could be established the claims of inventors or discoverers should their title to priority be called in question? Really "time is money," and it is a loss of both to read the discussions as to the veracity of the statements of such and such a man. Not only is it annoying to the reader, but it is putting on the rack the living, whose chief aim is to be of service to their contemporaries and to push forward an art to which they devote time, patience, and money. It is also bringing men from the grave and unintentionally diminishing the *prestige* which surrounds their memory. The late Archer-Bingham controversy is a proof of the latter; while the case of Wortley *versus* Lea is an evidence of the former. It is clear that something must be done to root out this evil, or it will, like

the *phyllorera*, spread through the photographic community, invade and take possession of our publications, and, what is worse, stop many amateur inventors from publishing their discoveries, fearing to be criticised. We have a great amount of respect for Mr. M. Carey Lea on the continent, and we have a high regard for Colonel Stuart Wortley, who was among those who brought to starved Paris the first provisions after the disastrous siege. Such a service is not easily forgotten by a thankful people; therefore, it is sad to see such a controversy taking place between two such men. Had a tribunal of honour been organised, the latter would not have been obliged to use the following words:—

"It is most unfortunate that any one who, as I did, attempts to bring out improvements in a process should always be attacked for his pains; and those who have other interests and pursuits in life feel a temptation to abandon public writing on photographic matters, so as to keep out of the constant hot water into which the discontented and envious endeavour to plunge them. I conclude by saying that, unless any statement is made impugning my honour or good faith, I shall hold no discussion with Mr. Carey Lea on processes. It can only bore your readers, and my ground is firm enough to withstand his attacks."

Do not the words of this paragraph appear to emanate from a heart overflowing with sadness, and appear from their tenor to say, "I am sorry that I ever occupied myself in writing on photography. Had I known the annoyances I should never have done so?" I beg that gentleman's pardon for anticipating or stating thoughts which, perhaps, have never crossed his mind. I have never had the honour of an interview with either of these gentlemen; but I should be indeed happy if my feeble idea could bring forth fruit, and so put an end to controversy among able and intelligent men which saddens their friends, is tedious to readers, and a loss of time and *prestige* to themselves.

3, *Place Bréda, Paris, March* 23, 1875. E. Stebbing, *Prof.*

## EMULSION EXPERIMENTS.—CONTINUED ACTION OF LIGHT.

*To the* Editors.

Gentlemen,—I find that gelatino-chloride is not so sensitive as Kennett's pellicle—at any rate, in the ordinary state and with alkaline development. I am nearly certain that the cause of this is the insensitiveness of chloride of silver to the red end of the spectrum.

I have increased the proportion of chloride to the gelatine, and also altered the developer since I sent my communication to the Almanac. I now use thirty grains of nitrate of silver to the ounce for sensitising the emulsion, and a stronger developer with less restraining bromide. I use three grains of pyrogallic acid in alcohol, two drops of a fifteen-grain solution of bromide of potassium, ten drops of Wortley's restrainer, and two drops of ammonium solution (*amm. fort.* and water in equal parts) to half-an-ounce of water.

This is a more powerful developer than that of Mr. Kennett, and is, I believe, as strong a one as the process will bear; yet, by using only about a tenth part of the restraining bromide Mr. Kennett recommends, I have been able with the bromide plates to get a fully-exposed negative in certainly one-third the time required for the chloride plates. My chloride plate had by far the greater density, and has, on looking through the sky, a black appearance with a yellowish tinge. The Kennett plate is brown.

I think that probably a bromide gelatine emulsion might benefit by the addition of chloride of silver. The latter would, I believe, give density, and not interfere with the sensitiveness.

I have tried urea in the chloride emulsion, and find that the plates prepared with it *do not* develope without the addition of ammonia. You will remember that this was not the case, on a certain occasion, with bromide plates. I really do not see how I can increase the sensitiveness of the gelatine chloride by any addition to it. The addition of organic substances, so far as I can see, seems to have no influence on the result, either for good or for bad; and I do not think the aniline dyes would be better—probably worse.

Since writing the above, I have added to Kennett's emulsion a third volume of my chloride emulsion, but I have found no advantage. I find that when the pyro. is added to the developer in alcoholic solution, instead of in water, the alcohol restrains the development without apparently affecting the rapidity of the plate to any appreciable extent. The question is—whether it is better to use more bromide in the developer, or use an alcoholic solution of pyro. The convenience of pyro. in solution is, doubtless, great; though, of course, *that* should not weigh with one if bromide will give better results.

With regard to Mr. Batho's paper on the alleged continued action of light on sensitised carbon tissue, I have experienced the same disappointment as he might have done on developing tissue kept long enough after exposure, according to written instructions, to produce a fully-printed picture. No action seemed to have taken place, or, if any, not sufficient to cause the tissue to yield a good picture.

I am extremely sorry to see announced in the Journal the death of Mr. Sutton. In him photography has lost a clever champion.—I am, yours, &c., Herbert B. Berkeley.

*Cotheridge Court, near Worcester,*
*March* 29, 1875.

P.S.—I do not find that urea raises the sensitiveness of the bromide emulsion, nor does the latter develope without ammonia when urea is present.—H. B. B.

## COPYING *CARTE* PHOTOGRAPHS.

*To the* Editors.

Gentlemen,—The following method of enlarging photographic prints from *carte* size to cabinet or whole plate, without showing the grain of the paper (the case if photographed in the usual way), may be of some use to your readers:—

Make a wooden tube about two feet long, one foot wide, and one foot deep, the top and one side to be of ground glass, the bottom and other side to be of wood. At one end have an arrangement for fixing the photograph to be copied. Place the tube in a good light, with the camera at the opposite end to that containing the photograph to be copied, and focus as usual.

By this simple arrangement *cartes* can be enlarged up to 8 × 10 without the grain of the paper being noticed at all.—I am, yours, &c.,

*Mount-pleasant, Lower Norwood, S. E.,* H. C. Cogswell.
*March* 29, 1875.

## THE INFLUENCE OF THE DIPPER.

*To the* Editors.

Gentlemen,—I have bought a large bath for 15 × 12 plates, but not being able to get a glass dipper I had to be content with an ebonite one. Would you kindly inform me if there be the slightest danger in the use of ebonite for a silver bath, as I have been much troubled lately with my baths and do not wish to run any risk through using the dipper.—I am, yours, &c., John Melling.

18, *Princes-street, Southport,*
*March* 29, 1875.

[For large baths we believe an ebonite dipper will answer not only as well as, but rather better than, one of glass. In the first place, a *good* ebonite has no deleterious action upon the silver bath; and, secondly, its lightness is an advantage. We have known of a large and valuable bath having had the bottom fractured by the glass dipper accidentally slipping from the fingers when immersing the plate, which in the case of an ebonite dipper would not be attended by serious consequences. In connection with this subject we advise that a small slip of ebonite be placed at the bottom of large dipping-baths, so as to break the fall either of the dipper or of a heavy glass plate, should such occur.—Eds.]

A New Size: The Promenade Photograph.—This is a new style designed by Mr. J. W. Taber with Mr. G. D. Morse, San Francisco. There has come to be a want felt for something new—some divergence from the beaten path we have been travelling ever since the cabinet picture became a success. All the changes that could be invented appear to have been rung on this and the "old reliable" *cartes de visite*, and for some time we have seemed to be languishing for want of *something new*. The "Victoria" did not succeed. It was a step backward. In the promenade picture we think we have it. It is novel, elegant, and, when made as these are from Mr. Taber, most charmingly attractive. The size of the picture, including the mount, is about four by seven inches; on this is a sixteenth-inch white border, then the half-inch marbled margin, leaving the picture proper a trifle less than three by six inches. These pictures are intended, as their name designates, for three-quarter or full-length standing figures; and the opening corresponds better with the human form in a standing position than any proportion of picture we have ever had. It gives a space above the head that looks as if the subject had room to stand erect. The improvement in these over the ordinary cabinet, for standing figures, appears about the same as that of a high-studded room to a low one. It gives an atmosphere and air of freedom that is really refreshing in comparison with some of the older styles, in which the head and top of the picture have seemed uncomfortably associated. There is not the appearance of "squattiness" that there is about the cabinet size. The width is also another advantage so long as the present style of ladies' dresses demands no more space, as it gives room enough and does not leave blank spaces that require to be filled by accessories, the injudicious use of which has worked so much injury to full-length pictures in the past. In these pictures there are no accessories whatever except a neat architectural background, or perhaps a pedestal or other vertical object. They are of a size that cuts the paper to advantage, a sheet making one dozen, and a sheet of 22 × 28 cardboard making eighteen mounts.—*Phil. Phot.*

## EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at the small cost of one shilling in our advertising pages. This column is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

A Lerebours' 12 × 10 view lens is offered in exchange for good quarter-plate or card lens, of 4½ inches focus; and a photographer's bicycle (strong and sound as new) for photographic views, transparencies or otherwise, sound gas bags, or other offers.—Address, H. Rogerson, North Parade, Bradford.

A patent cone whole-plate lens, by Jamin, will be exchanged for a very light 9 by 10 bellows camera with double backs; a strong French walnut camera, cloth bellows, focussing up to thirty-two inches square, for plates 11½ × 10, with two slides, for an 8 × 10 landscape or doublet lens, or anything useful in photography.—Address, G. Mansfield, jun., Naas, Ireland.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

J. A. F.—Thanks.

O. C. Smith.—In our next.

R. Bridgart.—On Saturday next.

G. M.—Received: the "Imperial" photograph.

Engineer.—The tone is rather cold. Were it a little warmer the picture would be a charming one.

Rev. B.—The colour of the deposit may be changed to orange by means of a solution of Schlippe's salt.

Uncertain.—A musical box as a pleasing "accessory" for the studio has been in use for many years.

H. O. (Liverpool).—The Astrachan leaf isinglass may be obtained from Messrs. J. H. and S. Johnson, Church-street, Liverpool.

Der Neugierige.—Our remarks had reference mainly to the employment of a transparent and fugitive pigment upon an unstable photograph. Carbon printing ought always to be employed as a basis on which to paint.

X. Y. Z.—Without seeing a specimen we could not hazard an opinion concerning the manner by which the effect described in your letter would be produced.

Photo. (Fulham).—We have never seen any cause for altering the opinion we expressed; indeed, as that opinion was based upon an existing fact it could not possibly be altered.

J. Wood.—Judging from the specimen, your series of views ought to command a ready sale in the localities near where they were taken. They possess, we imagine, a too purely local interest to sell in London.

Dried Albumen.—We have received a sample of dried albumen from Mr. R. W. Thomas, of Pall Mall. Of the great convenience of albumen in this form there can be no doubt. We are subjecting it to the test of experiment in the preparation of dried plates, for which we believe it to be well adapted, and shall report upon it in a future number.

An Amateur (Southampton).—Having mixed the chloride of ammonium with the albumen in such proportions as will suit the strength of your silver bath, whisk together to a froth, and then allow it to stand for two or three days, afterwards decanting into a flat dish. After a little practice you will acquire sufficient dexterity to enable you to coat the paper neatly and without air-bubbles.

L. L.—The chief fault we have to find with your enclosures is not in respect of composition, which is excellent, but in the obtrusiveness with which the accessories and unimportant parts are depicted. Let all these be toned down to such an extent as to make the faces of your sitters the salient portion of the picture to which the eye is first attracted, instead of the flowers of the carpet and the pattern of the tablecloth, which, although pretty enough in themselves, are out of place when defined with such staring prominence.

H. G. Rogerson.—1. We are aware of transparencies for the stereoscope having been produced by the Woodbury process previous to the time of which you speak, having seen those professedly produced in Italy. It is probable that the latter are Woodbury prints printed in the usual way upon paper, or upon some other surface prepared in such a manner as to enable the image to be transferred to the glass. We do not think that the pictures could have been printed on the glass direct, for that would necessitate the employment of *plate* glass, which, owing to the very low price at which the transparencies were sold, could not have been the case. —2. Lejune and Perkin, Hatton Garden.

W. J. B.—If you cannot so manage as to extend the length of your studio, it will be necessary that you make a careful selection of lenses of very short focus. We have some recollection of seeing, when in Liverpool, an ingenious contrivance adopted by a photographer there to secure additional length for certain purposes. It consisted of a door, hinged along the bottom, and which could be let down, by falling outwards, until it was level with the floor, it being prevented from falling lower by means of two strong supporting chains. The camera was placed upon this false floor, which was strong enough to support the operator, and in this way a considerable extension of the studio was, in effect, provided so as to suit special requirements. In the case of a studio erected upon the ground floor or in a garden less difficulty would be experienced.

A. M.—To obtain a fine white deposit on your collodion positive pictures, develope them with a solution prepared by dissolving a hundred and twenty grains of protosulphate of iron in ten ounces of water, and then adding an ounce of a saturated solution of gallic acid, by which the liquid will instantly become of an inky black colour. Now add nitric acid, drop by drop, stirring with a glass rod, until the liquid again becomes clear, after which add a little acetic acid. This is a good positive developer.

F. P. J. M.—The fogging complained of is evidently caused by the admission of false light into the camera. Obtain a large and quite opaque focussing-cloth, and having capped the lens remove the ground glass, cover your head with the cloth and hold the camera up, directing it towards the light; in this way some existing pinhole aperture may be detected. Next subject the dark slide, and especially its sliding shutter, to a searching examination; and in all probability your search will be rewarded by the discovery of the disturbing element.

A. W. (Hereford).—1. Very full details concerning photographic engraving will be found in our volume for 1865, in which two chapters are devoted to practical instruction in that branch.—2. The heliotype process is one somewhat analogous to lithography, with these points of difference—that the printing surface is formed of gelatine, and that the printing image is placed upon that surface by means of light. This kind of printing may be practised in this country without hindrance; but there are several patents for minor details, particulars of all of which are to be found scattered throughout our last four or five volumes, which contain numerous articles on this subject.

Young Assistant.—1. By following carefully the directions given in our Almanac you will be sure to succeed.—2. Try another sample of plumbago. —3. Italian stamps cannot be easily "converted" here.—4. Try the application of tincture of iodine followed by a strong solution of cyanide of potassium. It may, however, prove more convenient to mix them together. Proceed thus:—Place in a wine glass a bit of iodine the size of a pea, then add about a drachm of water; now throw in as much cyanide of potassium, in small lumps, as will cause the iodine to dissolve, leaving the solution clear. Apply this to the stains, using a camel's-hair brush for the purpose.—5 and 6. Melt the wax in any suitable vessel and pour it into the tray, which should then be kept warm before a fire so as to allow the wax to penetrate the surface. A tray of this description will suit your purpose well.

Liverpool Amateur Photographic Association.—Owing to unforeseen circumstances the meeting of this Association (which should have been held on the 30th ult.) is postponed until Monday evening next, the 5th instant. After the ordinary business has been transacted, a popular lantern exhibition of photographs will take place at a quarter to eight o'clock, to which the members and their friends are invited.

## PATENTS APPLIED FOR.

*February* 3, 1875.—"An Improved Stand for Exhibiting Photographic Pictures."—No. 403. J. F. Knip.

*February* 20, 1875.—"Improvements in Photographic Processes and in Apparatus to be used in Connection with the said Improvements."—No. 635. W. Tilley.

*March* 13, 1875.—"Photographic Apparatus." (Communicated by J. H. Hermagis.)—No. 937. W. Morgan Brown.

*March* 16, 1875.—"Improvements in the Production of White Photographic Plates, or White Surfaces to be used in Photographic Printing." (Communicated by H. M. Hedden and C. A. Hill.)—No. 966. W. Morgan Brown.

## METEOROLOGICAL REPORT,

*For two Weeks ending March* 31, 1875.

Observations taken at 406, Strand, by J. H. Steward, Optician.

These Observations are Taken at 8.30 a.m.

| March. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 18 | 30·59 | E | — | 34 | 42 | 33 | Cloudy |
| 19 | 30·15 | W | 37 | 38 | 47 | 33 | Raining |
| 20 | 30·15 | NE | 33 | 37 | 44 | 34 | Dull |
| 22 | 30·08 | W | 36 | 38 | 50 | 36 | Dull |
| 23 | 30·32 | E | 33 | 35 | 43 | 34 | Cloudy |
| 25 | 30·38 | W | 45 | 41 | 56 | 39 | Cloudy |
| 27 | 30·12 | W | 42 | 40 | 56 | 41 | Cloudy |
| 29 | 30·42 | NNW | 43 | 40 | 53 | 41 | Dull |
| 30 | 30·48 | N | 46 | 44 | 55 | 42 | Dull |
| 31 | 30·53 | NW | 49 | 45 | 58 | 45 | Dull |

CONTENTS.

THE BRITISH

# JOURNAL OF PHOTOGRAPHY.

No. 779. Vol. XXII.—APRIL 9, 1875.

## EXPERIMENTS WITH DRIED ALBUMEN.

Allusion was made in the last volume of our Almanac, and also in recent numbers of the Journal itself, to the use of dried albumen, and to its importance as an exceedingly handy article which should find a place on the stock shelves of the photographer.

Dried, desiccated, or flake albumen is no new thing; indeed, it is difficult to conceive of a time when its existence was unknown—certainly it has for many years been a commercial production, although its use in connection with photography does not appear to have been recognised, or, if so, known only to a very small extent until very recently. However, apart from any novelty associated with the photographic use of dried albumen, it is very certain that it may be made to conduce greatly to the comfort of those practitioners of the art whose demands and requirements for albumen are to a limited extent.

Dried albumen may be prepared either from the serum of blood or the white of egg, the latter being that which will assuredly find most favour with photographers. If white of egg be placed in a bottle or deep vessel and allowed to stand for a few days it becomes quite putrid and unfit for any use; but if it be spread out on flat plates and rapidly subjected to the influence of the air in a warm, not hot, place the water evaporates, leaving the albumen quite desiccated, when it assumes the form of a hard, brilliant, gum-like substance of a yellow colour. This, when broken up in small fragments and placed in a dry bottle, will keep good for many years, the mere addition of water serving to convert it into its original liquid form. In the experiments we made in the desiccation of albumen—for when we first commenced our experiments with this preparation it was not obtainable at any photographic warehouse—we found that ordinary tin plates possessed the best kind of surface upon which to spread the albumen, as such a plate or sheet allowed the dried albumen to separate from it with facility. Should any better method be known we shall be glad to have it communicated to us.

We have recently been putting dried commercial albumen to numerous photographic uses, with the view of discovering if there were any difference between its action and that of freshly-beaten-up white of eggs, and, if so, wherein lay the difference.

First of all we prepared four collodio-albumen plates—two by the desiccated and two by freshly-beaten-up albumen. The particular collodio-albumen process we selected for trial was one with which we have had considerable experience, and which is associated with the name of Dr. Ryley, its introducer. It is probably one of the most certain and simple of the large family of collodio-albumen processes, and for the benefit of those who may not be acquainted with it we shall here take occasion to explain it.

A plate is collodionised and immersed in the silver bath in the usual way, and when taken out is well washed with plain water. A small quantity of diluted albumen is poured upon the surface, care being taken that it is made to flow over every part of the film. We find it always best to pour away the first portion that has been thus used, and then apply a little fresh solution. The plate is now plunged into a flat vessel containing very hot water, by which the albumen on the collodion film instantly becomes coagulated, this being effected in as thorough a manner as if it had been immersed in a very strong bath of nitrate of silver. After a few seconds the plate is withdrawn and allowed to dry, when the film will be found to be very hard and smooth. It is advantageous to apply a three-grain solution of gallic acid to the plate previous to its being placed in the drying-rack, as it causes the plates to keep better and develope cleaner.

The albumen solution we used for preparing these plates was, in the case of the freshly-made solution, composed of the white of one egg, three ounces of water, and ten minims of ammonia, all beaten well together and allowed to stand till the solution became clear, after which it was filtered. In the other case—that of the desiccated albumen—sixty grains of this substance were dissolved in four ounces of water containing ten minims of ammonia. As all the four plates which had been prepared in this way yielded splendid negatives, the conclusion forced upon us is that dried albumen answers quite as well as fresh albumen for all purposes in which it has to be used in the preservation of negative plates.

A second trial to which we subjected the flake albumen was in the preparation of a photolithographic transfer, which we conducted on the principle adopted at the Topographical Branch of the Dutch War Department, at the Hague, and which consists in sensitising paper with albumen and bichromate of potash, as albumen is found to possess advantages over gelatine. The dried albumen was dissolved in water in about the proportions of seventy grains to the ounce of water, together with such a proportion of bichromate of potash as it would stand without crystallising when it was dried. Smooth wove paper was coated with this preparation, and, when dry, it was exposed under the negative of a map. The paper was then made to receive a thin coating of lithographic transfer ink, applied by means of a large dabber, after which it was placed in a vessel of cold water. On rubbing the surface with a sponge every line and dot of the map stood visible with great boldness, the whites being entirely denuded of ink. The transfer had now only to be "laid down" on the lithographic stone, and handed over to the printer. For this purpose the dried albumen proved highly successful.

One further experiment was made to test the capabilities of the dried albumen, viz., using it in the albumenising of paper for photographic printing. Having dissolved the albumen in water in the proportion of seventy grains to the ounce we mixed with it chloride of sodium in the proportion of twelve grains to the ounce, and floated each sheet of paper on this bath for a minute, after which it was suspended to dry in a very hot room. This paper, when sensitised on a strong silver bath and afterwards printed and toned, an acetate toning bath being employed, yielded proofs in nowise inferior to the best sample of paper prepared with ordinary fresh liquid albumen.

These experiments are fairly representative, and prove that for photographic purposes the dried albumen is not inferior to the fresh. We do not go so far as to say that it will be advisable to use it instead of the fresh when the latter is at hand, and especially if it have to be used in large quantity; but we do contend that its convenience and excellence should prompt every photographer to keep a bottle of it among his chemicals, for, although it takes a few minutes to become dissolved, it is then clear and ready for use, whereas

when albumen fresh from the egg is to be used it must be subjected to such beating up as to convert it into a froth, the subsidence of which involves the loss of much time.

Again: it is sometimes necessary to adopt a very strong solution of albumen, which with ordinary white of egg cannot be obtained unless allowed to stand for several hours exposed in a flat vessel to a current of dry, warm air to carry off some of the water, whereas with the dried albumen a solution of any desired strength can be made at once.

Much of the dried albumen of commerce is obtained from the serum of blood; indeed, if we are correctly informed, *all* the albumen used in sugar refineries is of this kind. We have examined side by side desiccated albumen prepared both from blood and from eggs, and confess our inability to distinguish between them. Their chemical constitution is stated by eminent analysts to be alike; it is probable that in their photographic application little difference, if any, will be discovered.

## EMULSION TROUBLES.

To most persons who have worked much with emulsions it must be patent that there is still a great deal to be learnt in connection with this branch of photography. Though perfectly under control, as a general rule, they are subject occasionally, even in the hands of skilful workers, to erratic fits, during which, without apparent reason, they obstinately refuse to be coaxed into working order. The particular phase of difficulty to which we wish to refer in this article is the precipitation of the sensitive salt, and we shall endeavour to explain at least some of the causes which bring about this evil.

It is scarcely necessary to say that the principal physical quality aimed at in forming an emulsion is to obtain a precipitate of bromide or other haloid salt of silver of such a degree of fineness as to show no granularity even when examined under the microscope. In the course of numerous experiments, dating very far back in the history of emulsion photography, we have always found that an emulsion possessing this physical property in a satisfactory degree is invariably workable photographically. Furthermore, we have observed that an excellent test of the working qualities of an emulsion is the colour of the film when viewed by transmitted light. A properly-made emulsion of bromide of silver gives a film which, held before a gas flame, presents the appearance of having been stained a full orange colour, clear and transparent. This class of film may, perhaps, not be the most sensitive, but it is, according to our idea, the most generally useful from its reliability. The more sensitive emulsions—containing excess of silver nitrate and *aqua regia*—possess the same orange colour, but not the transparency of the slower ones, a slight dulness, scarcely to be described as "semi-opacity," being observable by transmitted light, while the surface of the film is dead and flat-looking. If a film be obtained which by transmitted light presents a pale yellow, lavender, grey, or sometimes steel-blue colour, it may be at once rejected as useless; for, though no granularity may be visible to the naked eye, the microscope will make it painfully apparent.

Worse than this—in appearance, at least—is an emulsion in which the haloid is formed in clots which refuse to remain in suspension. We say worse in appearance, because this trouble is frequently remediable; indeed, so slight is the cause and so simple the cure that we have known an emulsion, after some minutes' shaking, suddenly separate into clots and immediately re-emulsify after another shake. There are some cases, however, in which great care and patience are requisite ere the defect be removed. To such cases and their cures we shall now devote a few observations.

The first great principle in the formation of an emulsion is the well-known fact in chemistry that precipitates are thrown down in a much finer state of division from weak than from strong solutions; hence the directions given in sensitising an emulsion to add the silver gradually. The mere act of throwing in the whole of the silver at once, or even a great part of it, especially if in hot alcoholic solution is sufficient to break up the emulsion. The cotton is precipitated by the sudden addition of the hot alcohol, and the collodion thus thinned is incapable of holding in suspension the coarse particles of bromide which form almost instantly when the cotton is precipitated. Vigorous shaking will cause the re-solution of the pyroxyline; but the probability is that the bromide will require further treatment, of which more anon. The remedy for, or rather the prevention of, this state of things is obvious enough—adhere to the directions given.

The next point to be borne in mind is that the silver bromide is formed in a much finer state in the presence of excess of soluble haloid, excess of silver nitrate tending to the opposite result. This explains the fact that slow emulsions—that is, those containing excess of soluble bromide—give the most beautiful films and developed images of great density, fineness of deposit conducing as much as anything else, in our opinion, to the latter effect. Care should, therefore, be taken, in forming a very sensitive emulsion, to add the silver nitrate slowly and in small quantities, especially when the combining equivalent has been reached or passed. The same remark, of course, applies to an emulsion which is over-sensitised, so as to subject it to the action of free silver nitrate for a time, to be afterwards neutralised by the addition of soluble bromide.

Another cause of "clotting" of the emulsion is the overloading it both with pyroxyline and soluble salts. It is reasonable to presume that a collodion containing pyroxyline almost to saturation is less able to bear the addition of a quantity of hot alcohol than one only half saturated. It is also evident that a heavily-bromised collodion requires a larger quantity of silver nitrate, which must perforce be dissolved in the smallest possible quantity of alcohol. The emulsion is thus formed under the worst of all conditions—a collodion unable to bear the addition of alcohol without, at least temporarily, precipitating a large portion of its pyroxyline, the momentary result being a mixture weak as regards cotton but strong in salts, which enter into combination and are deposited before the pyroxyline can be re-dissolved. This may be a slightly-exaggerated picture as regards an ordinary emulsion; but in working Mr. W. B. Bolton's process we fear that the desire to economise solvents by forming a heavily-loaded emulsion may lead some amateurs into difficulties, and we strongly urge our readers to beware of such short-sighted policy.

The strength of the solvents has a very marked effect upon the character of the emulsion as regards the quantity of soluble matter it will bear. By the employment of solvents of the highest strength a much greater quantity both of pyroxyline and silver bromide may be used than is possible with lower-class samples. Finally, the pyroxyline itself, as well as the length of time it has been in solution, materially influence the power of an emulsion to retain a large quantity of silver bromide in suspension.

If through inattention to any of these points a failure such as we have spoken of should occur, the best way of remedying it is to add to the spoilt emulsion a measured quantity of bromised collodion, shaking well until the clots disappear, when it may be re-sensitised by the addition of the proper quantity of silver nitrate. It will be found better to delay the re-sensitising for a few hours in order that the solvent action of the free bromide may have its due effect on the emulsion.

There are probably many of our readers who have been fortunate enough to escape the difficulties we have alluded to above, and many, perhaps, who may think we have given undue prominence to the matter; but we cannot avoid feeling that the comparative rarity of this form of emulsion trouble is the reason it has been so little studied. We think this should not be so. The recurrence of an almost forgotten difficulty in the course of experiments with Mr. M. Carey Lea's chloriodo-bromide process has induced us to lay before our readers the foregoing remarks.

## ON THE VARIABLE RESULTS OF EXPERIMENTS IN PHOTOGRAPHY.

That photography advanced with wonderfully-rapid strides during its early days, and that steady and certain progress of no inconsiderable amount is being made even now, are facts that will be readily admitted by all who give the subject a little consideration. We

think, however, it will be as readily conceded that, taking into account the vast number of workers and the extent of the circulation of photographic literature, the progressive results are not by any means what they should be. In photography, as in everything else, there will always be found some men who—with an eye only to material results, and with no higher object, or rather with no other object, than the realisation of pecuniary results—closely guard, as an important secret, every little "dodge" or "wrinkle" which in the course of their business they may discover. Still, as a rule, such an order of mind counts for very little in the advancement of anything. Photography, especially, can lose but little they could impart, and can do very well without such—much better, in fact, than they can do without photography.

There are, however, many thousands of competent workers, earnest observers and careful experimentalists, whose main object is the diffusion of the knowledge of which they have become possessed, and whose highest aim is to be in every way instrumental in advancing the art in which they are so much interested. Keeping this in mind the question naturally arises—Why are there so many problems in connection with the chemistry, or, perhaps, we had better say, the physics, of photography unsolved? and why is there such diversity of opinion on what in connection with almost any other subject would be considered questions so simple and so easily solved? The latent image is still, in a large sense, a *terra incognita;* the value of a supplementary exposure, notwithstanding all that has been written about it, is regarded by many as a joke; and many writers hold widely different opinions as to the cause and cure of blurring.

Now, we have no doubt that one cause of this undesirable state of matters lies in the fact that photography as a science is not, and can hardly ever be, as exact as that of chemistry. So long as there is a variableness in the quality and intensity of the principal factor—light—so long will there be a degree of uncertainty in all experimental results. But this does not account for all, or even for much, of the existing uncertainty. A much more influential cause will, we imagine, be found in the too frequently indefinite way in which experiments are recorded, and in the consequent difficulty experienced in their repetition. As an illustration of our meaning we may cite the discovery, by Dr. Vogel, of the influence of certain colouring matters on films of bromide of silver. His experiments were repeated, both here and on the continent, by men whose ability is above question, and they had no hesitation in declaring that he had been mistaken; and yet some assert that he was right. What we believe to be really required is that experiments should be made with much more exactness than is too frequently the case, and that when recorded very particular care should be taken that the *matériel* employed should be properly described, and the conditions under which the results were obtained minutely explained. In fact, the writers should treat photography as a branch of chemical science; and in all cases where new or unexpected results are obtained not merely names, but chemical formulæ, temperature, intensity of light, &c., should be given, so as to enable their experiments to be at once properly tested.

As a case in point we may instance the frequent mention of "sal soda" in articles in some of our American contemporaries, and the frequent inquiries which, in consequence, we have had addressed to us as to the nature of this substance. Now if the (we presume) partially local name had been followed by the formula—

$$Na\,CO_3 + 10\,H_2O,$$

it would have been at once understood to be the common carbonate of soda (ordinary washing soda), which, in its crystalline state, contains ten equivalents of water. We are aware that there are some of our readers who skip all notation formulæ, because they have never taken the trouble to make themselves acquainted with them; but so impressed are we with their value that, for the benefit of such readers, we have some idea of soon giving such a simple account of photographic chemical notation, showing its great usefulness so clearly that readers will be induced to spend the few minutes required to master its use.

We have been led into this train of thought by a notice which appeared in a recent number of the *Bulletin de la Société Francais,* in which M. Noel claims to have discovered that by the substitution of methylic alcohol for alcohol in the developer the exposure might be reduced from forty-three to four seconds. We need hardly say that if this should turn out to be true M. Noel will have altogether taken "the wind out of the sails" of even the most enthusiastic advocates of supplementary exposures. We took the earliest opportunity of putting his claim to the test of experiment. We were, however, at the very outset met with an impediment. What is actually meant by "methylic alcohol?" In England the question is not difficult to answer, as we are aware that the designation is almost universally applied to pyroxylic spirit—a product of the fractional distillation of the volatile matter obtained during the destructive distillation of wood. That this could be the substance used by M. Noel we had considerable doubt, as, long since, we had experimented somewhat largely with it, both as a solvent for pyroxyline in collodion and as an addition to the developer. However, we resolved to look into the thing again, and, having procured samples of the spirit from several sources, tested the matter as follows:—

In a series of test tubes we placed solutions of silver nitrate of the ordinary bath strength, and added to each a portion of a twenty-grain solution of iron. A similar set of tubes were treated in like manner, except that to the solution was added portions of the methylic spirit. The reduction of the silver was carefully watched, but nothing occurred which would at all warrant the expectation that methylic was in any sense superior to ordinary alcohol. Iron with pure and methylated alcohol was treated in the same way, but still the result was purely negative. Experiments were next made to see if the methylic alcohol possessed any marked reducing power *per se;* but, although both it and ordinary methylated spirit gave, when heated with powdered nitrate of silver, a slightly-coloured solution, while pure alcohol gave one free from colour, there was no visible reduction of metallic silver after many hours.

This, of course, was not promising, but we consoled ourselves with the hope that a better result might be obtained in actual development. For this purpose we used the graduated band mentioned in previous articles, the illuminating agent being a clear north sky. A few experiments showed that with the ordinary developing solution an exposure of eight seconds was required to get an impression extending to and including the fifth division on the scale. M. Noel's developer and also those with methylated spirit were then substituted for the ordinary solution, but without the slightest appearance of increased action. Exposures were then made both of much shorter and longer duration, but still with the same result; that is, in no case did the methylic spirit seem to have any influence in the direction of shortening exposure, or, in other words, in no case did plates developed with solutions to which it had been added show a trace of detail greater than those developed with the ordinary solutions.

We do not by any means wish it to be understood that we think M. Noel mistaken. We rather hope that by the designation "methylic" alcohol he understands something different from what the name implies here, and urge the probable misconception as a reason for greater precision in the description of experiments, and as an inducement to experimentalists to use more freely the facilities presented in chemical notation in publishing photographic formulæ.

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Last week it was our pleasing duty to direct attention to Mr. M. Carey Lea's new chloriodo-bromide emulsion process. We have since then received from that gentleman a full description, to be found in another column, of a further and most important improvement which has occupied his attention for some time past, but which he elected not to publish until the completion of his experiments and—shall we say?—perfection of the process. The improvement consists of a combination of the chloriodo-bromide process with that of Mr. W. B. Bolton published last year, together with a new feature, which renders the latter process applicable to any description of emulsion, namely, the treatment of the partially-desiccated emulsion with a suitable organifier. The result is a process said to combine the simplicity of Mr. Bolton's process with the extreme sensitiveness obtained by the use of excess of silver. The use of the organifier in this manner is so obvious as to cause one to wonder how it has so

long escaped publication. A second process which Mr. Lea sketches out appears to us to sink into insignificance when compared with the one he has given in detail. We think, however, it might be of use in the formation of an iodide or bromo-iodide emulsion in large quantities commercially, the ordinary method being objectionable on account of the great amount of shaking necessary. We do not wish to express dissent from our able correspondent's closing remarks on the subject of patenting these two methods; but we are afraid it would be found rather a difficult matter—at any rate in this country. As regards the second modification—the application of silver solution to the partially-dried collodion—we must remind Mr. Lea that Mr. Houlgrave, a member of the Liverpool Amateur Photographic Association, described, about twelve months ago, his method of making the sensitive pellicle, which was similar to that of Mr. Lea, as far as regards sensitising the collodion after partially drying. It is, of course, impossible to say anything as yet about the working of the process; but we hope in the course of a few days to be able to do so, as we shall lose no time in giving it such a trial as shall enable us to report upon it for the benefit of those who are preparing for the work of the summer, and to whom, we believe, this process will prove a great boon. Meanwhile, the very explicit directions given by Mr. Lea will enable any of our readers who may feel interested to work the process at once.

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Without discussing the moot point as to whether the lighting or the manipulation has most to do in securing a fine portrait, it will be conceded that without the former the latter would prove very ineffective. To ensure proper illumination the light must fall upon the sitter from such directions as are entirely under the control of the operator—a somewhat difficult matter to accomplish when every article in the interior of the studio is illuminated quite as strongly as the sitter. As a consequence, such articles radiate or reflect light in directions in which it is not wanted, and in which it does positive mischief. The conditions of perfect lighting are a concentration of the luminous rays upon the sitter and a perfect immunity from them at the camera end of the studio. Mr. Vanderweyde, whose name is very familiar to our readers, has recently been endeavouring to solve, in a practicable manner, the problem of perfect lighting conducted according to the principles just enunciated, the result being that he has completed an invention by means of which the whole of the light admitted into the studio shall be concentrated just where it is required—upon the sitter, and nowhere else, no matter at what end of the studio he is placed—the arrangement being such as to leave the camera end in comparative darkness. The brilliancy thus secured is undoubted. With respect to the details of the method by which this invention is to be carried into effect we are scarcely prepared to speak; for, although we have seen and carefully examined the model glass house submitted to us by Mr. Vanderweyde, we cannot feel justified in describing it at the present moment, as he is securing his invention by letters patent. That his system will answer in a most effective manner the purpose intended we entertain no doubt whatever.

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## A NEW EMULSION PROCESS.

In the present paper I propose to make public a process which, I think I may venture to say, possesses a very high interest; in fact, no photographic work in which I have ever been engaged has appeared to me comparable with it. By all dry-plate workers it has long seemed most desirable to obtain a method by which a mixture being simply poured over glass should give a plate possessing all the desirable requisites, including a very high sensibility. Mr. W. B. Bolton, by a most ingenious idea, solved one part of the problem by forming an emulsion which, poured over glass, needed no after-treatment. But these plates are, unfortunately, deficient in sensitiveness, and the application of a backing is indispensable.

The method which I propose here to describe gives, by simply pouring an emulsion over glass, not only a high but, I may say, an intense sensitiveness. Moreover, by virtue of the silver iodide which they contain, these plates need no backing. They develope with great rapidity and need no intensifying, so that the whole operation, from first to last, is reduced to the most absolute simplicity. The advantages in the way of facility of management and the high degree of sensitiveness are such that I should not be surprised to see these dry plates largely supersede the wet process; in fact, a beginner will more easily work this dry method than the wet when the emulsion is to be obtained commercially, which it soon will be, as I do not propose to place any restriction upon its manufacture by anyone who may choose to prepare it.

A remarkable point is that this high sensitiveness is obtained *without the presence in the emulsion of any substance soluble in either the alcohol and ether or in water*, except, of course, the pyroxyline. The finished emulsion contains insoluble substances only; there is, therefore, every reason to expect that it will keep indefinitely, as well as the plate made with it. The addition of substances like gallic acid to the final emulsion to get sensitiveness seems to me very objectionable; the emulsion must soon spoil, and the plates containing an active agent soluble in water must be liable to injury by the least exposure to dampness. Besides, even at this expense the object is only very imperfectly attained.

The method by which I obtain this intense sensitiveness is very simple. *Instead of applying a so-called preservative to each separate plate, I apply it to the whole mass of emulsion at once.* I pour out a quantity of emulsion into a pan, and pour over it, as soon as set, any form of preservative whatever—albumen, gallic acid, tea, coffee, tannin—anything, in fact, that may be preferred. After allowing the preservative to act for ten or fifteen minutes I wash out every trace of soluble matter by a thorough washing, then dry and re-emulsify.

The application of this system, even to an emulsion prepared after Mr. Bolton's method—namely, a simple bromide emulsion prepared with excess of alkaline bromide—will give a very sensitive plate. But when we further add the improvements of excess of silver nitrate with a chloride and *aqua regia*, and the introduction of an iodide, we get without additional trouble a surprising degree of sensitiveness. The excess of silver nitrate increases both sensitiveness and density (not one at the expense of the other); the chloride gives brilliancy, the *aqua regia* cleanness, and the silver iodide trebles the sensitiveness. I have thus been enabled to combine these other improvements with the new one of applying the preservative—or accelerator, as it should properly be called—to the whole mass at once. This application of the accelerator is not only a vast saving of time and trouble, but its action is rendered much more thorough and equal. When applied to a single plate its action is exerted on one surface only of the emulsion; but in the new method it is enabled to act on all the surfaces of the detached pieces, and penetrates them through and through. Even if any inequality of action should take place, such as would produce a streak on a single plate, this is neutralised by the subsequent emulsification of the whole mass; the action is thereby equalised, and the whole body of the emulsion becomes perfectly homogeneous. Streaks and stains in the plates made in the new way are, therefore, almost impossible, except from exterior causes; they cannot arise from unequal action of the materials upon each other.

### Collodion.

To each ounce of solvents, consisting of alcohol and ether in equal parts, take—

| | |
|---|---|
| Ordinary crystallised cadmium bromide ... | 6½ grains. |
| Ammonium bromide................................ | 2 ,, |
| Ammonium iodide ................................ | 1½ grain. |
| Cupric chloride ................................ | 1½ ,, |

About eight grains of intense pyroxyline to the ounce, with two drops of *aqua regia*. Sensitise with silver nitrate, using from twenty to twenty-five grains to the ounce. The first-mentioned quantity is excellent for ordinary work; when a very high degree of sensitiveness is desired the larger quantity may be used.

As the emulsion as first prepared is to be dried, it is not necessary to take particular pains to exclude water. For this reason I have made the formula include ordinary crystallised cadmium bromide. For the same reason it is not necessary to pulverise the silver nitrate and dissolve it in alcohol; I dissolve the crystals in about their own weight of water, and then add three or four times as much alcohol, and heat again until perfectly dissolved. This much latitude may be freely taken, but the solution in water alone must not be added to the collodion; the alcohol must not be omitted. And if, as mostly happens, the alcohol precipitate part of the silver nitrate heat must be applied until it redissolves.

But, for the same reason—namely, that the emulsion is to be dried—some economy may be practised by making a more concentrated emulsion, as follows:—

COLLODION.—2ND FORMULA.

| | | |
|---|---|---|
| Ordinary cadmium bromide | 9 | grains. |
| Ammonium bromide | $2\frac{1}{2}$ | „ |
| Ammonium iodide | 2 | „ |
| Cupric chloride | 2 | „ |

Use about ten grains of intense pyroxyline. The silver nitrate must be increased in the same proportion as the salts, so that twenty-five to thirty grains to each ounce of concentrated collodion will be proper. Three ounces of this collodion will, after treatment, give four ounces of finished emulsion.

The best results are obtained by keeping this emulsion, with occasional shaking, for from twenty-four to thirty-six hours. It is then to be poured out into a flat dish and allowed to set. Particular care is needed in this part of the operation; the preservative must be applied just at the right time—neither too soon nor too long after the pouring out. The emulsion must be occasionally examined and moved about in the dish to promote equal drying. As soon as a skin forms on it holes must be made through it, and the collodion underneath be made to flow out and over it. If this be neglected the surface will become hard and leathery before the emulsion is set underneath. The object is to keep the whole mass as nearly uniform as possible, and, as soon as it is gelatinous, to apply the next treatment. The proper condition can be judged of by touching with the tip of the finger; as soon as nothing comes off upon the finger the emulsion is ready for the preservative.

Any preservative may be used. As to the effects of different preservatives I will speak presently. If the lesser quantity of silver be used the preservative may generally be applied in its ordinary condition; but if the larger, then it will be well to add to the preservative one-tenth of its bulk of ordinary acetic acid (No. 8 or Beaufoy's).

The preservative is to be poured into the dish, and then immediately the film is to be ploughed up with a porcelain, horn, or glass spatula (not a metallic one), and reduced into small pieces; and the whole, preservative and film, is to be transferred into a convenient glass jar—not too small. The flakes of emulsion are to be occasionally stirred and left in contact with the preservative for fifteen minutes from the time when it was first poured over the mass. (In operating upon a large scale, commercially, it will probably be found better to leave a little longer in contact with the preservative, and *always* to acidify. For working with a few ounces the foregoing is the right way.) The preservative is then poured off and water poured on, the flakes well stirred up, and the water changed several times. The flakes are then left to stand under clean water for about an hour; then several more changes; then stand another hour; then several more changes. By this time everything soluble is extracted from the flakes; indeed, after the first hour no silver can be found in the wash-water. We have now only to dry. This may be done at ordinary temperatures, or the vessel may be set over a stove, provided its bottom be not allowed to become hotter than the hand can bear. The drying must be thorough; the flakes shrink wonderfully, and curl up like tea leaves. They are not white, but of a medium grey colour, notwithstanding which they make a pure cream-coloured emulsion.

To re-emulsify, the dried flakes are put into a bottle and are covered with one-third ether, one-third alcohol, and one-third plain collodion. They must be well shaken at intervals. The new emulsion is not in good order till after, at least, forty-eight hours, and is better at the end of a week. When it has once been thoroughly mixed with the liquids, and has been shaken at intervals for some days, it seems to lose all disposition to settle, and makes a most excellent emulsion. There is no reason why it should not keep indefinitely. Or it may be preserved in the dry state and emulsified at any time, using from twenty to twenty-five grains of the dry emulsion to each ounce of solvents. Three and a-quarter ounces of collodion, formula No. 2, will yield about one hundred grains of dry flakes.

PRESERVATIVES.

The character of the image will depend very much upon the preservative used.

1. *Albumen Preservative.*—This gives an exceedingly sensitive and delicate plate, with much less density than most of the other treatments. For this reason I prefer it to the rest, as tending to give detail in both lights and shadows, with great varieties of half-tone. My formula is—

| | | |
|---|---|---|
| Water | 12 | ounces. |
| Thick gum and sugar solution | 1 | ounce. |
| Prepared albumen * | 1 | „ |
| Sixty-grain alcoholic solution gallic acid... | 1 | „ |
| Sixty-grain tannin solution (in water) | $\frac{1}{2}$ | „ |

* See my paper of 12th March.

*To be added in the order named.* If rather more density be required, double the tannin. I use it as above. This preservative works very cleanly and satisfactorily; I use it exclusively.

2. *Gallic Acid and Coffee.*—A mixture of gallic acid and coffee, using about two ounces of sixty-grain solution to twelve ounces of infusion of roasted coffee, gives very good results; it should, however, be acidified with acetic acid, using about half-an-ounce of Beaufoy's (No. 8) to the above quantity. It gives a blacker image than No. 1, and more intensity. It will probably be useful when the pyroxyline is deficent in intensity. It gives excellent transparencies by exposure under a negative, but too intense for lantern work, for which No. 1 is much better, as well as for negatives.

3. *Tea.*—Scarcely so favourable as the last.

4. *Salicine.*—Inferior results.

5. *Gallic Acid and Tannin.*—Very intense image, but does not work clean unless acidified.

6. *Gallic Acid and Gum Arabic with Sugar.*—Very sensitive, but easily spoiled by over-exposure. This latter quality makes this preservative very unsatisfactory with these plates. The latitude of exposure, which with Nos. 1 and 2 is very great, with a gum-gallic preservative quite disappears. A plate exposed for three seconds under a negative to a gas-light flashed out in the developer, and was entirely over-exposed and spoiled; whereas, with No. 2 good results were got with exposures of one second, four seconds, and thirty seconds.

[This difference serves to illustrate how valuable and how worthless high sensitiveness may be. The high sensitiveness that is accompanied with latitude of exposure is precisely what is wanted; that which must be exactly hit under penalty of spoiling by over-exposure is quite worthless.]

DEVELOPMENT.

For a $6\frac{1}{2} \times 8\frac{1}{2}$ plate pour four ounces of water into a $7 \times 9$ dish, add half-a-drachm of sixty-grain solution of pyrogallic acid in alcohol, and put in the plate. Mix in a bottle equal quantities of a fifteen-grain solution of potassium bromide and an eighty-grain ammonium carbonate. Of this mixture pour one fluid drachm into the dish. When the detail appears add another drachm, and later, if necessary, a third; or add half-a-drachm of the ammonium carbonate solution without bromide. The two first additions must have bromide; the third is best without for a negative—best with for a transparency. Fix in hyposulphite solution of the same strength as used for wet plates.

I should have mentioned that I always keep the collodion for a month—for several if possible. The plates should be edged with a solution of india-rubber in benzole.

The addition of silver iodide greatly checks the tendency of the solutions to force their way under the film. This is a material advantage; that of preventing blurring a still greater. I entertain no doubt that the use of an iodide for emulsion work will become as universal as that of a chloride, which I introduced five years ago, has become.

After having worked this process for a time one comes to feel as if all the labour had been eliminated out of photography, and only the pleasant part left. This is easily understood by comparing with the amount of work necessary with an ordinary emulsion. After coating with the older form of emulsion the plate is plunged, with or without washing, into a preservative bath, in which each plate must have its full time, thus greatly interfering with the course of coating. As each plate should have ten minutes it follows that this time must intervene between the coating of each plate, or else one must have several baths of preservative. I have usually found three necessary. There is also the preparation of these baths every time a batch of plates is made, and we must be sure that all the ingredients are in good order. Great care is necessary to allow the right time for each plate to set before plunging it into the bath (or washing, as the case may be); for, as I have long since remarked, a plate kept fifteen or twenty seconds too long requires a double exposure, so much is its sensitiveness lowered. This has been one cause of the irregularity complained of with dry plates. Again: the preservative bath is continually changing by reason of the silver nitrate introduced into it by each plate, so that each plate necessarily differs a little from the one previous, and the last plates of a batch may be quite different from the first, even with every care. It is true that this may be avoided by pouring the preservative fresh over each plate; but this is a worse alternative, for it then requires great skill and constant care to get equal action and avoid streaks.

Next comes the trouble of drying. The film, being soaked with a wet and more or less sticky preparation, dries slowly, and must, while drying, be thoroughly protected in a drying-box. In many forms of

drying-boxes this drying requires thirty-six hours to be complete and uniform. I have always dried by sulphuric acid, and found that I could not with entire safety use my plates in a less interval. I never felt willing to dry spontaneously, because of the exposure to laboratory fumes involved. Then comes the backing and the drying of the backing. This has been really unavoidable; all the aniline colours, without exception, detract materially from the sensitiveness of the plate, even when very lightly applied. Finally: there is the washing off of the backing—the most disagreeable part of the whole work, and that needing the greatest circumspection to avoid getting a drop upon the film.

This long catalogue of dry-plate troubles—the vexation of which every dry-plate worker knows only too well—explains why dry plates have been by many so unfavourably regarded, and considered as so uncertain.

With the process here described all these troubles disappear. The emulsion having been made, or bought, is poured over the plate —and there is the end of it. It needs no washing, no preservative; it is dry in a few minutes—so quickly that no drying-box is needed, the plates being simply left on a rack, and in half-an-hour may be stored in a plate-box or put into slides. There is no backing needed, thanks to the iodide, and no dangerous and troublesome washing off. The exposure is reduced to a minimum; the development is rapid, and no redevelopment needed. I do not see how even wet-plate work for portraiture is to compete with this; the exposure is no longer, and the plates can be prepared in advance, so that sitters need not be delayed, and the valuable middle hours of the day can be greatly economised. Of course here the question is one of sensitiveness, and if the directions I have given be closely followed the emulsion has nothing to fear from competition with the wet process in this respect.

But these directions must not be diverged from. Mr. Newton, the well-known and skilful dry-plate worker, of New York, remarks, in one of his papers, on the very common habit of varying from the directions of a process and then condemning it for the failure, or partial failure, that results. In this process it is especially necessary to adhere closely to the formulæ. I can best illustrate this by the result of an experimental trial lately made on the effect of the iodide. I increased the proportion of iodide (in the first of the above two formulæ) by *one grain*—that is, from one and a-half grain to two and a-half grains. The result of this small change was that *the sensitiveness fell off to one-quarter*—this trifling change had so altered the character of the emulsion. Perfectly good images were obtained, but *a fourfold exposure was needed.*

With the emulsion prepared as I have directed I obtain regularly and with facility a good transparency by exposure under a negative to a gas-light of one second, and from that down to half-a-second. The image comes up full and strong, and no redevelopment or pushing is necessary.

In addition to this process, I have discovered another, which differs still more from any hitherto in use. My paper is already so long that I shall postpone the details of the other process till next week, and here only give an outline of the esssential and characteristic features.

A suitable *collodion*—not an emulsion—is poured out into a dish and allowed to set. A silver bath is poured over it and left in contact until sensitised all through, and then is poured off. Next (with or without washing) a preservative is applied, and again washed out. The plates are then dried and emulsified. Any preservative may be used. I have tried albumen, gallic acid, tannin, gum, &c., using them combined in two or three or more. Success depends upon certain precautions of detail which I will furnish in a few days. Or, the proceedings may be reversed, and the silver nitrate be dissolved in the collodion and the haloids applied in a bath, though in this way the same sensitiveness cannot be expected.

So far, my preference is for the method which I have here fully described—that beginning with the emulsion. It gives more sensitive plates than when the silver is applied as a bath on the collodion film after setting; but the latter is also a beautiful and useful method.

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The two methods which I have described here—the one in full, the other in outline—have essentially new features, such as would permit of their being fully covered by a patent. The principle of applying a preservative to a mass of material at once and then washing it out again could be patented. This is common to the new processes. The plan of applying a silver bath to a mass of partially-dried collodion is also new and patentable. Convinced as I am of the very great usefulnes of these processes, I believe that such patents would be very valuable. I prefer, however, to give them freely to anyone caring to use them, asking only, in return, to have them ascribed to their author and not appropriated by those who may make trivial modifications on them. M. Carey Lea.

## THE SO-CALLED "CONTINUATING ACTION OF LIGHT."

This subject is one which, in its relation to the action of bichromates with gelatine, must be considered of the greatest importance. One of the difficulties in the Woodburytype, as regards general practice, lies in the fact that parallel rays are absolutely necessary in the production of the relief; and hence photographers are tied to using artificial, and therefore costly, light or the rays of the sun, which latter are not always available. In the curious decomposition hitherto attributed to continuating action may lie a means of overcoming this difficulty—at least, it is imagined I see a way thereto; and the time may not be far distant when a specially-prepared tissue on paper—or, in the language of patentees, "or other flexible material" for reliefs—may be a commercial reality, and then good-bye to silver printing.

While thanking Captain Abney for taking the opportunity to point out wherein he thinks I met failure, and that at a time when I apprehend he is rather full of work, it is but fair to say I had not overlooked the difference—if difference there be—between a tissue sensitised by immersion and sensitised by mixing the bichromate with the gelatine. Having made photo. reliefs on talc he will be aware that it entails some experience with "mixed" tissue, and my impression is that the action of such tissues is similar to that sensitised by immersion.

Whatever may be the cause of the so-called "continuating action" at least one point is generally agreed upon, and that is that the resulting insolubility of the gelatine is owing to the deoxidation of the chromic acid, no matter how this action is brought about; hence the reasoning is not unfair that whatever brings about insolubility would accelerate, certainly never arrest, any alleged continuating action. Now, Captain Abney says—"It is important to keep the tissue in a dry atmosphere, as too much moisture retards the progressive action in the dark. Wet quite destroys the sensitiveness of the bichromated film—a fact which enables prints to be developed in daylight." On the other hand, Mr. J. W. Swan says—"It was evident that in the presence of water there was, independent of light or extra atmospheric heat, a reaction between gelatine and bichromate similar to that produced (or, to speak more correctly, *accelerated*) by light." The parenthesis and italics are not mine.

As to wet destroying sensitiveness I may mention that photo. reliefs have been made on wet films, and if any carbon printer will expose to the light for a few minutes a piece of tissue just taken out of the bichromate bath, and saturated with water, he will convince himself on this point. That carbon prints can be developed in daylight is, in my opinion, owing to the quantity of water employed dissolving out the bichromate, thus effectually arresting all action.

It was not for a moment dreamt that Captain Abney thought darkness "induced" some chemical action; and any who could hold such an opinion would be decidedly "verdant." Still there is some difference between an action set up by light and continued in the darkness without any other agency and the intensification of a negative by the deposition of silver (necessarily brought about by other agents) on the metallic silver already deposited by the developer. As the latter is Captain Abney's idea of the change, I want to find *what is the equivalent in the action in question to the pyro. or, rather, intensifier, in his illustration.* This is the unknown element he possesses and I have eliminated. Now, would not an opportunity for working together be grand?

"Facts are stubborn things;" hence the fact I have related is to be included in that class. It is a fact I have not based on one experiment; and instead of that experiment being a failure it was a success, it having been undertaken to show that carbon prints could be kept in the dark without gaining intensity and without employing any active agent. W. E. Batho.

## FOREIGN NOTES AND NEWS.

Continuation of the Details of Herr Remelé's Journey to the Lybian Desert.—Photography at the Préfecture of Police.—The Transit of Venus.—The Acetate of Lead Toning and Fixing Bath.—New Photometers, by M. Boivin.

The caravan started from Siout on the 18th December, and bivouaced that evening at the usual place of encampment of the caravans from Inner Africa. Herr Rohlfs had brought tents for his party from

Paris, which were both strong and light. His own tent was large enough to accommodate the five members of his expedition at supper time; the others merely contained a folding camp bed, chair, and table. Being unaccustomed to the work, the party found the loading of their camels rather a ticklish business, and for the first few days everything did not go smoothly with them. Sometimes a camel which was not properly loaded would throw off a few packages; then another would shy or stumble, and precipitate his unskilful European rider ignominiously from his high perch to the sand. Between Farafreh and Dachel a sad misfortune happened to Herr Remelé. A frightened camel shied and threw off one of the plate-boxes amongst rocks and rubble; the box itself was completely destroyed, and out of 200 plates of the largest size only seventy-nine were saved.

Herr Remelé found that, as the only halts made were at the resting-places for the night, a photographer could do nothing during the marches of the caravan. He thought of staying behind occasionally to photograph, keeping the camel that carried his "traps;" but this plan was impracticable, as, owing to the time required to pack and unpack the tent, he would have been unable to overtake the caravan. This was the less to be regretted as there were few points of interest accessible from the oasis.

After a twelve days' march through the desert they at last came in sight of Farafreh, the smallest oasis of the Lybian Desert. The village seemed quite close, but the clearness of the atmosphere deceived them as to the distance, and they had yet a good six hours' march before them. The caravan was to remain two days at Farafreh, and Herr Remelé, wishing to make the most of his limited time, as soon as they halted made his way to the famous gardens of Farafreh, and selected various points for the following day's operations. Of course the work to be done next day depended entirely on the weather, and Herr Remelé's anxiety on that point led him several times in the course of the night to disturb the jackals that prowled about his tent.

St. Sylvester's day rose bright and clear, with the thermometer at freezing point, but the sun soon warmed the air, and by eight o'clock the tent was pitched in the gardens. The gardens of Farafreh are very dense, and the sun being low in the heavens the first view required an exposure of ten minutes; but as the light increased the exposure decreased to five minutes and then to one minute. Meantime, both the temperature and the wind rose, and it was only possible to expose a plate in the lulls between the gusts of wind. In addition to these drawbacks, when we mention that the prepared plate had to be carried long distances no one will wonder that every plate was not a success—that some of them dried and became spotted.

Another day the camera being placed out of sight of the tent an enterprising Farafrenser unscrewed the camera, which fell to the ground, and the expedition, as far as Herr Remelé was concerned, had a very narrow escape of an untimely end. On the morning of the 18th of January, when working in the desert, he was suddenly overtaken by a simoom. Some views that had been placed to dry in the plate-rack on a flat stone were riddled with innumerable holes in an incredible short space of time by streams of sharp, drizzling sand, and the unlucky camera was still further damaged by being blown over, tripod and all, amongst stones. When the clouds of sand had abated, with broken apparatus and worse than no result to show for his toilsome journey, he had to make his way back to the tents through the desert, which had never before seemed to him so dreary.

He preserved, as curiosities, one or two of these plates, and when they arrived at Gasr Dachel his Arab servant proved himself quite a capable workman, and with a cocoanut-tree board patched up the camera and a plate-box so as to be serviceable again. It was astonishing that after so many falls the objective remained uninjured.

During the rest of the time they remained at the oasis of Dachel days quite free from wind were the exception rather than the rule, so that the real working days were few owing to the abundance of trees and the luxuriance of the foliage. The trees there, and, above all, the ever-present date palm, shook much more easily than the thick-stemmed German trees to which Herr Remelé had been accustomed. The crown of the palm, notwithstanding the fifteen or sixteen feet of length of its fan-shaped branches, sways incessantly with the slightest breath of wind, and he says that though the palm plays the principal *rôle* in Egyptian landscape, and a photograph should be considered useless that does not give it sharp in all its details, yet amongst all the views he saw in Egypt he did not find *one* with sharply-defined palms. Acacias, whose leaves and twigs are very sensitive to wind and troublesome to the photographer, were also abundant in the oasis of Dachel and at Farafreh; but with patience Herr Remelé overcame even this difficulty and obtained not a few sharp negatives.

During their stay at Gasr they had a very heavy fall of rain—an unusual occurrence in that rainless country. The atmosphere, which was previously clear and dry, suddenly appeared charged with moisture, which gathered in clouds and at last became rain, falling almost incessantly the whole of the night of the 2nd February. The houses there are entirely built of sun-dried mud, and the unexpected downpour was rather alarming; it softened the houses and even threatened to lay the whole town in ruins. However, its fury abated about midnight, bnt not before it had driven in, with great noise, the roof of the hut next to Professor Ascherson's. They were duly informed by the "oldest inhabitant" that there had not been such a heavy fall of rain for at least thirty years.

The number of negatives Herr Remelé obtained before leaving the oasis of Dachel on the 15th of March was 150—a very fair number considering the difficulties that beset him on every hand.

Herr Remelé's description of the character of the Arab is by no means flattering. He says the Arab is greedy, dishonest, turbulent, stubborn, and insubordinate. It was almost impossible to keep the Arab servants in any kind of order if they were not directly under the eye of the "great lord," Herr Rohlfs. In the desert, too, they were almost completely dependent upon supplies of provisions fetched from certain stations by their Arab servants, and the situation became extremely unpleasant when these latter returned with unladen camels. Herr Remelé confesses that he was very glad when at last they were joined by their comrades from Sinai, and turned their steps towards Farafreh again. At Farafreh they were anxiously looked for, and, indeed, it was sometimes feared they were lost, as they were fourteen days overdue, and their supplies of provisions, water, and fodder were almost exhausted.

Two leagues to the west of Gasr they came upon a ruinous old Egyptian temple almost buried under rubbish and fallen stones. They excavated it, and found that, though the sandstone roof had fallen in during some earthquake, the side walls were still standing, completely covered with well-preserved hieroglyphics, which had been protected from the action of the air by the mass of rubbish under which they were concealed. Herr Remelé took a number of photographs of these hieroglyphics, which were of considerable interest to Egyptologists. In photographing these inscriptions the best results were obtained when the sun did not shine directly on them.

On the 30th of March they came in sight of Esneh, and the coal smoke of the sugar factory there—the first sign of civilisation they had seen for months—was greeted with shouts of joy.

The celebrated temple at Esneh is now almost completely closed up with sand, even the entrance hall being scarcely kept clear. He obtained one or two views of the interior of the entrance hall; but owing to the dimness of the light the exposure lasted twenty minutes, and the intense heat dried some of the plates before they were fully exposed. At Thebes, where the caravan halted for a day, and where Herr Remelé concluded his photographic labours, he encountered the same difficulties, viz., drying of the plate from heat and long exposure, when taking some very interesting old Egyptian wall paintings.

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The *Moniteur* of April 1 contains a descriptive account of the uses to which photography is put at the Préfecture of Police. The writer speaks highly of the results produced under the greatest difficulties. The apparatus and lenses used are of French manufacture and of the best quality, the operators being trustworthy men holding the rank of sergeant. In addition to the immediate wants of the Préfecture, the duties of the photographic staff extend to the Depôt, Mazas, Sainte Lazare, and other prisons, as well as to the Morgue. The division of labour is very similar to the arrangement in other studios, particular care being given to the registration of the negatives; retouching is almost unknown. It is only the most important or dangerous criminals whose photographs are taken and distributed, and even with these little difficulty is experienced in obtaining a favourable *pose*. Such scenes as a criminal being held in position by two or three warders while he is being photographed against his will are never witnessed; on the contrary, the sitters as a rule exhibit no inconsiderable amount of vanity in their attempts to show themselves off to the best advantage or to hide any personal deformities. Besides portraiture several other branches of photography are cultivated. It frequently happens that the only means of tracing a criminal is by placing copies of his portrait in the hands of the police throughout the country. For this purpose the method of reproduction from *cartes* or other pictures is resorted to. Circumstances often arise rendering it important that a photograph of the locality where some crime has been committed, or an accident has happened, be obtained as soon after the occurrence

of the event as possible; this necessitates the employment of a staff of outdoor operators. The reproduction of maps, plans, letters, or other documents required as evidence in the courts of law, is also carried on by the photographic department of the Préfecture, so that in point of variety of work there remains but little to distinguish it from other establishments.

The party sent out by the French government to the Island of St. Paul to observe the transit of Venus appear to have made good use of photography. M. Mouchez, who was at the head of the party, reports to the Academy of Sciences that the photographic instruments were at work during the whole period of transit, the result being four hundred and forty-three daguerreotypes and one hundred and forty-two negatives on collodion. Deducting sixty-seven of the former and twenty-nine of the latter, which were partial failures, there remain four hundred and eighty-nine utilisable pictures, which will be employed for the purpose of obtaining micrometric measurements under the special direction of M. Fizeau.

M. Alcide (of Saintes) writes to the *Moniteur de la Photographie* in favour of the addition of acetate of lead to the toning and fixing bath. He has, he says, prints which have received the acetate of lead treatment and still retain their original beauty, while others produced at the same period, and toned in the usual bath of gold, have quite faded. M. Alcide's method is to pass the prints through a spent bath of gold and acetate of soda, and without washing to remove them into a solution of hyposulphite of soda and acetate of lead, with the addition of ten per cent. of bicarbonate of soda. Any tone may be obtained, and the whites maintain the greatest purity.

M. Boivin, who has just completed a series of papers on carbon photography, is about to introduce, commercially, two new photometers—one for use with dry plates, the other exclusively for carbon printing. No description has yet appeared, but they are said to answer the purpose completely.

## THE RECENT ECLIPSE OF THE SUN.

On Tuesday morning last, the 6th inst., between the hours of five and eight o'clock of our time, the sun was totally eclipsed. This eclipse was not visible in Europe, being confined to the Nicobar Islands, Burmah, Siam, and Anam, in which places total darkness prevailed for five minutes. The line of total eclipse ran from the Cape of Good Hope to Burmah and Siam, and thence to the North Pacific. It is known that our government has rendered great assistance, by an appropriation of a thousand pounds, in having this eclipse properly observed; and with this, aided by the Peninsular and Oriental Steam Navigation Company, the committee have been able to organise and send out six full equipments from Europe.

The most striking thing about the Royal Society programme (says *The Times* of Tuesday) is its simplicity. For the first time in eclipse expeditions, no eye observations are arranged for; all the phenomena are to be photographically recorded. Here we see the enormous advance which has lately been made in these studies; for we may remind our readers that in 1871, when the Astronomical Society were appealed to to use their influence to secure observations of the eclipse of that year, a committee of that Society would not agree to employ photography at all!

There is another point. It is now more than probable that not even polariscopic observations will be attempted, although, thanks to the care of Mr. Spottiswoode, arrangements have been made for photographing the polariscopic corona, as it may be called, if a spare observer presents himself.

The ground has been cleared in yet another way. The photographs of the corona, which were so strongly insisted upon by Mr. Lockyer in the observations of the eclipse of 1871 and objected to by the Astronomical Society, were necessary to determine the solar or non-solar origin of the corona. This question has now been set at rest by showing that part of it is really at the sun, and this is now termed the coronal atmosphere. When this was settled, it was suggested by the same observer that this atmosphere would very likely be found to vary in shape and dimensions with the sun spots. This is the question, then, that is to be attacked in the old way on this occasion; and, on the suggestion of the Royal Society committee, the Viceroy has charged Captain Waterhouse with this duty. He will use the same instrument that was used by Major Tennant and himself, in 1871, on Dodabetta. The ground, then, being thus cleared, the main objects to be attempted this morning are the determination, so far as may be possible, of the chemical constitution of the chromosphere and of the coronal atmosphere; of the height to which the various vapours extend from the photosphere, and of the order in which they thin out. As it is anticipated that the chromosphere, at all events, may be very rich in ultra-violet rays, and as the solar spectrum has already been photographically compared with metallic vapours from G some distance outwards, the operations will be mainly photographic, glass being employed as little as possible to produce the necessary dispersion, and replaced by quartz. The attack is twofold, spectroscopes being used in conjunction with telescopes for obtaining line spectra, and prismatic cameras being employed for the purpose of obtaining images of the chromosphere and coronal atmosphere built up by the rays emitted by the various constituents, on the plan adopted by Professor Respighi and Mr. Lockyer in 1871. The committee anticipate that the prismatic camera will probably give the best results with regard to the height and order of the various layers, while the general nature of the spectrum beyond H—*i.e.*, whether it is continuous, channel-spaced, or lined—will be best determined by the ordinary spectroscopes. The spectroscopes attached to the telescopes are of the ordinary kind, with the exception that the prism and lenses are of quartz. The cameras attached to them in lieu of the ordinary observing telescopes are in some cases of long, in others of short, focus, so as to secure at all events some impression, and possibly one over a considerable range of the spectrum. Those of long focus are to be used in connection with a siderostat or a reflector. All the spectroscopes are furnished with slits of a novel description; so that the whole slit, or any one, two, three, or four-fifths of it can be opened at will.

This premised, the following extracts from the instructions will be readily understood and will give an idea of the work of the observers:—

"Before and after totality the cusps should be continually thrown on the slit and the spectrum photographed; long exposures should be at first employed. At least one spectrum of the sun should be obtained before totality, with the ordinary position of the plate, in order to indicate the parts of the plate on which the various parts of the spectrum fall with the angle of deviation and the orientation adopted.

"In all the instruments, just previous to totality, the vanishing portion of sun is to be used to obtain a scale on the plate on which the attempt will be made to obtain the spectrum of Young's stratum, and the other phenomena at the beginning of totality.

"For this purpose one of the end windows will be opened, and all the others closed in the first instance, the open part of the slit being arranged radially over that portion of the sun's light which will be the last to disappear. Immediately before totality all the windows are to be opened without deranging the instrument.

"For observations at the end of totality all windows except one at the end of slit to be opened. The part of the sun which will first reappear should lie on the slit just outside the closed shutter (the motion of the moon being taken into account), so that the phenomena at moment of reappearance may be photographed. Immediately after reappearance the previously-opened shutters should be closed, and the previously-closed shutters should be opened to obtain the solar spectrum as a scale. Care should be taken not to confound the brighter parts of the chromosphere at reappearance with the sun itself."

The instruments termed "prismatic cameras" are ordinary three and three-quarter-inch achromatics, with a large prism of small angle outside the object-glass, and a camera replacing the eyepiece. Such an instrument will give spectra of small dispersion.

Of course, with such an instrument as this employed on the full sun the impression on the plate would be a blurred spectrum containing no detail, but as the advancing moon reduces the part of the sun still remaining visible to a thin silver crescent, then the instrument will begin its work; the actual shape and thickness of each stratum of vapour above the photosphere will be impressed by each coloured ray its light contains, and will stand out on a band of continuous spectrum, which will get feebler and narrower as the silver crescent thins to nothingness. Then the whole ring of chromosphere and coronal atmosphere which will burst upon the eye will be sorted out, if all goes well, into its various metallic constituents, by means of a chain of rings of greater or less thickness and regularity upon the photographic film. The vapours extending furthest outwards from the photosphere will be represented by the broadest rings, those lying closest to the photosphere by the narrowest.

The instructions are careful to insist upon complete rehearsals before the day of the eclipse, so that we may be assured that the simple programme we have sketched may be simply carried out, and that the observers will not attempt too much. It is as well to state this because persons unaccustomed to observations might imagine from the multiplicity of detail in the instructions that the labours of the observers will be more than ordinarily complicated.

Each party will have a telespectroscope and a prismatic camera. In addition to this equipment Professor Pedler will use a heliostat, focussing the image of the sun on a spectroscope from which the slit has been removed. As a camera he uses a Janssen slide, which he has arranged so as to get thirty pictures.

We are reminded incidentally by the instructions on "the multiplication of results" of the enormous advantage of the photographic method; there is no chance of error or forgetfulness. The observations sent home to the Royal Society will enable those on whom the labour and responsibility of reducing them will fall to almost reconstruct the eclipse for themselves.

With respect to an addition to the party sent out from Europe—and which includes the names of Dr. Vogel and Mr. Beasley—the *Daily News* says:—Apart from the work which Vogel and Janssen may be expected

to accomplish, we know that a party of observers from India will be at work; and that Mr. Davis, the photographer of Lord Lindsay's transit expedition will also be on the scene of action with well-trained assistants, and excellent means for photographing the corona. Good photographs of the corona on this occasion will throw important light on questions of solar physics. The sun during the eclipses of 1870 and 1871 was marked by many spots, indicating a condition of great disturbance. The corona photographed on those occasions was therefore the corona belonging to a disturbed sun. Now it has been noticed by Professor Young, of Dartford College, N.H., that as the spots have gradually diminished in number during the last three or four years the coloured prominences have become smaller and less brilliant. Mighty outbursts of glowing hydrogen (or else of matter flung from the sun's interior through the hydrogen atmosphere of the sun), had occurred frequently during the years 1870-'71, and '72. Some of those volcanic explosions had been characterised by an inconceivable violence. It was during one of these, which occurred on September 7, 1871, that matter was ejected from the sun to a height of more than 200,000 miles—that is, to a height exceeding eightfold the entire circumference of our earth. But latterly no great eruptions have taken place, and the evidence tends to show that in some way as yet to be explained the solar prominences and the solar disturbances indicated by the presence of spots are associated together—possibly as arising from one and the same form of internal disturbance. Now it will manifestly be a matter of extreme interest to ascertain whether the inner bright corona and the outer, more complex and partly radiated corona, sympathise, so to speak, with the condition of the sun's interior. Hereafter it may be hoped that photographs of the corona will be secured (if possible) during every total eclipse of the sun, so that we may learn something of the laws of periodic change which doubtless affect this wonderful solar appendage. It may be, too, so strangely has the domain of our sun been as it were extended outwards by recent researches and theoretical investigations, that the zodiacal light (probably an extension of the outer corona) may be found to undergo changes corresponding with those thus recognised in the corona. Should this prove to be the case, we should find in the sun not the solitary globe which former astronomers recognised, but a mighty nebula, with a glowing centre girt round by envelope after envelope of gaseous, meteoric, and cometic matter. It is to photography that we must chiefly look to secure this triumph, seeing that the solar envelopes intermediate to the bright prominences and the corona cannot be examined or measured, their nature determined, or their changes noted, without the aid of photographic records.

# Contemporary Press.

## LIGHTS AND SHADOWS IN A PICTURE: THEIR USE AND VALUE.

[ROOT'S "CAMERA AND PENCIL."]

ALTHOUGH persons ignorant of artistic effect may find fault with the most effectively disposed lights and shadows, I would yet counsel every heliographer to give his productions the highest possible artistic value. This he should do, not alone for his own reputation, but for the honour of his art and its professors.

If insensible to these motives he may well doubt his possession of the qualities indispensable to his profession. At all events, a skilful, delicate use of lights and shadows is essential to the production of those heads truthfully modelled and well "rounded up," which can win for their author the proud title of "artist."

"Do architects," queries Sir Charles Bell, "while arranging the masses of their buildings for effect, study enough how the shadows will fall?"

It seems, then, that even in a structure of wood or stone care should be used that the shadows shall be cast so as to secure an aspect of appropriateness and beauty; and that without such care all labours else are comparatively futile.

How noble an expression may be stamped upon an edifice by managing this department skilfully is shown in the Parisian palace of the Louvre, and in Oxford, Cambridge, and other colleges and buildings in England, of which excellent photographs are frequently to be met with. There are also many other heliographs of noble specimens of architecture effectively taken by experienced and genuine artists.

If, then, light and shadow be essential to the artistic excellence of a building, how much more so to the perfect image of the human face and figure!

Wherever there is bright light shadows are of extraordinary prominence and importance—and this alike in nature and in art, the transcript of nature. Commonly, indeed, shadows are more conspicuous than the objects that produce them; for, while equally large with these objects, they are darker than their darkest parts, since the aspect of the objects is modified both by direct and by reflected lights. Their broad, equable spaces, therefore, strongly impress the eye, especially as their outlines are defined by lines sharper than nature ever uses in defining objects themselves.

Hold some small object above a piece of white paper in bright sunshine and you may note two things—first, that the object shows a soft outline, while the shadow exhibits a sharp, decisive edge; and, second, that the shadow is of a very much darker hue than the object. An eminent art-critic affirms that such a shadow will be threefold darker than a piece of black cloth laid in the light.

In a landscape, then, on a clear, sunshiny day the shadows are actually the most conspicuous things next to the strongest lights. In fact, it is chiefly by them that what forms, and especially the peculiarities of forms, *are* is perceived. For instance, the roughness of the bark of a tree can be seen neither in light nor in shade, but is defined by the shadows of its ridges. To represent vivid light, therefore, we must first get sharp, visible shadows.

Again: in nature the intensest light and darkest shadows are always sparingly employed, and this invariably in points, and never in masses. If the light be in a large mass it is *subdued*, and the shadow, if broad, is feeble. The interval between such contrasted light and shadow is occupied by middle tints and pale greys. Into this scene nature introduces here and there a spot of high light, and here and there one of intense gloom; the effect of which is to vivify the whole. Her invariable rule, then, would seem to be to furnish the same amount of deepest shadow as of intensest light, and neither more nor less—points of each answering to those of the other, and both showing vividly out from the rest of the landscape.

Such is nature's method of managing light and shadow; and herein the artist has a model which he should strive to the extent of his ability to copy. Masses of diffused, soft light balanced by masses of expanded, mild shadow, the space betwixt the two being filled by carefully-graduated middle tints; while here and there a keen, bright spot of light is set off by equivalent spots of deep shadow. *Here* is the programme to which the wielders of the pencil and the camera should alike endeavour to conform; and the nigher they approach it the more do they exhibit the genius and executive skill of the artist.

It is impossible, on paper, to tell the heliographer *how* he can make his one simple instrument execute a work so complex and delicate, but, if he have the eye of genius, there need but industry and perseverance in observing and experimenting to discover the *modus operandi;* besides that, he may be essentially aided by an accomplished artist handling the camera before his eyes.

What we call "relief"—that is, the apparent *standing out* of the object from its ground—is effected by the *contrasting* of light and shadow. So, would you produce breadth and splendour of effect, join together masses of light objects and corresponding masses of dark objects. Again: to get harmony and softness sink some objects wholly or partially in shadow, and let their outlines be insensibly lost in the ground. Finally: to create vivacity and spirit make, in some parts of the picture, abrupt breaks and sharp transitions.

# Meetings of Societies.

## LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE monthly meeting of this Association was held at the Free Public Library and Museum, on Monday last, the 5th instant,—the Rev. J. D. Riley, President, in the chair.

The minutes of the previous meeting were read and confirmed.

Mr. HOULGRAVE exhibited a number of negatives to show the excellence and keeping qualities of plates by the emulsion-without-washing process, as prepared by Mr. Bolton's formula. Several of the plates had been kept eight or ten months, and with them were shown companion pictures taken on plates by Major Russell's tannin and bath formula, showing the superiority of the former, although Mr. Houlgrave had previously practised Major Russell's process. He (Mr. Houlgrave) said he now preferred to use Mr. Bolton's pellicle process to any other he had tried, there being so little liability to stain or spot the plates consequent on the slight amount of handling required in their preparation.

The Rev. H. J. PALMER showed some interiors of Beverley Minster taken on Kennett's gelatine plates. The exposure had been only one minute ten seconds in December last. Every detail was there, and he (Mr. Palmer) would not have given, with his experience in taking interiors, less than an hour with any other dry plate.

The PRESIDENT then read a letter from Mr. H. Baden Pritchard in reference to a fund that was being raised for the widow of the late Mr. O. G. Rejlander. He (the President) or the Secretary would be glad to take charge of any subscriptions that were sent in.

The members then adjourned to the lecture hall for the purpose of holding a "popular" meeting. Here they were joined by a large company of their friends.

The PRESIDENT, in opening the proceedings, said that the lantern entertainment they were going to present that evening could scarcely be given as a continuous lecture, the object being more to show a miscellaneous collection of transparencies selected chiefly for their novelty and interest, and also for their beauty and excellence as photographs. The

transparencies had been nearly all produced by Mr. F. York, of Notting-hill, London, who had been wonderfully successful in obtaining from life the portraits of so many of the animals in the Zoological Gardens. Many of these would be shown on the screen, and also a selection of Mr. York's beautiful views of London, India, and America. The members were greatly indebted to that gentleman for his kindness in granting the use of them for the evening. They had also to thank Mr. Knott for the use of some of his excellent views of American scenery, as this would enable Mr. C. Dawson (who kindly undertook the duty of lecturer) to give them a graphic description of a country with which he was intimately acquainted.

Mr. Knott then entertained the company for nearly an hour and a-half with a series of views, &c., the excellence and appreciation of which were continually manifested by the applause of the audience. The entertainment was rendered all the more enjoyable by the amusing remarks and descriptions of the lecturer, who seemed equally "at home" in America, India, London, or with the animals in the "Zoo."

## Correspondence.

MEETING OF THE PHOTOGRAPHIC SOCIETY OF FRANCE.—M. GEYMET ON THE MULTIPLICATION OF NEGATIVES.—A MACHINE INTENDED TO FIX THE ATTENTION OF THE SITTER.—AN INTELLIGENT IDEA FOR WORKING THE WET PROCESS WITHOUT A LABORATORY.—A NEW FOLDING CAMERA FOR DRY-PLATE WORK.—M. LÉON VIDAL ON CARBON PRINTING, &C.

THE Photographic Society of France held its monthly meeting on Friday evening last, the 2nd instant,—M. Balard in the chair. A very cordial welcome was given to two gentlemen on a visit to Paris—M. Léon Vidal and M. Rommelaere, Secretary of the Belgian Society of Photography.

M. Guilleminot presented for the examination of the members a parcel of pyroxyline made by him at a high temperature, which, he said, was adapted in every respect for the preparation of dry plates. Several of the members expressed their satisfaction with the cotton furnished to them from his establishment, and gave it as their opinion that his pyroxyline No. 1 for the wet process was superior to the best-made Russian cotton, being uniform in its action and easy to dissolve. M. Guilleminot has made great progress in this most important branch of industry.

M. Geymet, whose increasing efforts for the progress of photography has often brought his name before the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY, made a very interesting communication to the Society supplementary to his invention of multiplying negatives or positives by means of blacklead powder. That gentleman passed round a collection of negatives taken from a single one. They were certainly much superior to the original negatives. He gave the following formula:—

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|---|---|
| Water | 35 ounces. |
| Glucose | 3 ,, |
| Gum arabic | 1½ ounce. |
| Honey | 6 drachms. |
| Water, saturated with bichromate of ammonia | 7½ ounces. |

After having well-cleaned a glass warm it slightly and pour the solution upon it. When dry warm it again and put it immediately into the printing-frame over the negative to be reproduced, and expose it in the shade from two to five minutes. After exposure take it into the dark room and brush over its surface some finely-pulverised black lead. Leave it one minute, then recommence the operation; leave it again for a minute, and so on till the proof is complete. The graphite could be replaced by enamel powders of different colours, which, being passed through the fire, would become vitrified, and produce splendid stained glass windows at very little expense. "I am surprised," added M. Geymet, "that manufacturers neglect such a simple and cheap means of producing designs on glass. My reason, indeed, for speaking of this process this evening is because I have been able to improve it in a notable manner since I had the honour of bringing it before the Society six years ago, and for which invention another person obtained a gold medal at the Vienna exhibition. Every one knows that the yellow colour given to the negative by the chromic acid causes a difficulty in printing positives from such a negative; also, that when positives are intended to pass through the fire the acid prevents, in a great measure, the action of vitrification, while at the same time it communicates its yellow tinge to the glass. The following is the method I now employ to eliminate the chromic salts, and thus rid the negative or positive of that disagreeable yellow tinge:—Dissolve three drachms of boracic acid in boiling water, and add it to seventeen ounces of alcohol; filter the solution into a tray, and plunge into it the negative or positive to be cleaned; allow it to remain till all the yellow tint has disappeared, this taking generally from five to eight minutes. The office of the borax is to immediately coagulate the gum and glucose, which prevents the proof from becoming disturbed; the the alcohol at the same time dissolves out the chromic acid. In positives intended to pass through the fire the borax serves as a dissolvent, and thus facilitates the vitrification. But the borax can be replaced by alum in the solution intended only to clean negatives for the printing-frame."

M. Geymet advised the members present to try this process; "for," said he, "I am certain that the multiplication of negatives by means of plumbago will sooner or later render great service to photographers for the carbon process and also in fatty-ink printing. Negatives made after this process are much finer than in carbon; for the graphite has an unction, combined with a fineness of texture, which we would seek for in vain in carbon. Nor is this all—the substratum for my process being gum, the pellicle is not liable to the distortions to which gelatine is subject." M. Geymet terminated by giving experimental demonstrations how to obtain enamels in an easy manner. In fact, in looking at him when going through the different manipulations of passing the film upon the glazed surface of the enamel, and the drying, colouring, and baking of the same, one could imagine it to be but "child's play" to make indestructible pictures.

M. Carette laid before the Society a very ingenious instrument intended to attract the attention of the person when sitting for a portrait. The apparatus consists of a disc about sixteen inches in diameter, on the upper part of which is a square hole, before which is made to appear, by means of clockwork, a certain number of *cartes de visite* or other pictures. If the model has a sad appearance when sitting a collection of gay and amusing subjects is brought to view; if too lively the photographer has the choice of other subjects. It is, above all, for children that the apparatus will be found most useful. It is astonishing to witness the change of expression in a sitter's face when the images pass before the opening. Not only does this little apparatus cause the expression to be brightened now and then, but it kills time, as it were, by amusing the sitter.

M. Nicolle, who is better known by the name of Dubroni, has invented a new apparatus for taking pictures in the open air without a laboratory. This time, I am happy to say, he has taken a step in the right direction. He has given us a tray for the sensitising and another for the development. This new apparatus he calls the "heliograph." The camera is an ordinary one; it is only in the dark slide that a great change has been effected. When the curtain is drawn up a silver frame is to be seen; this frame can be pushed out of the dark slide (about two inches) by means of two screws which pass through the sides of the dark slide. It is easy to perceive that this silver frame is intended to carry the glass. The manner of operating is as follows:—After the glass is collodionised it is fixed in the silver frame by means of two small catches—the collodionised surface inwards. The curtain is now drawn down, and immediately on the frame being hooked upon a tray containing the silver bath the curtain is raised, and by means of screws connected by a cog-wheel the glass is pushed to the bottom of the tray containing the silver solution. The tray is now brought to a horizontal position, and the nitrate bath flows over the surface of the collodion. When the plate has remained a sufficient time in the liquid the operator turns the wheel, which draws up the plate into the dark frame, pushes down the curtain, and takes off the nitrate tray. The dark slide is then placed upon the camera and exposed. The dark frame is now hooked upon another tray containing the developing solution, the curtain drawn up, and the glass pushed to the bottom of the tray. By means of simple mechanism the two small catches which hold the glass are opened; this movement frees the silver frame, which is then drawn up into the dark slide to prevent its being contaminated by the developing solution. The latter is now allowed to flow over the plate, and, what is more, its action can be followed by the operator, as the bottom of the developing tray is of red glass, a little slip of the same being placed in the curtain of the dark slide. If I mistake not, French ingenuity has here overcome a great difficulty, and I should not be surprised if this invention meet with great success; for, as I have already said, a step is taken in the right direction.

Decidedly the wind has set in the direction of inventions for cameras. M. Fleury Hermagis presented to the Society a new folding *camera obscura*, intended for dry-plate work. When the front shutter which carries the lens is drawn up the camera falls flat; this is done by means of the four sides being hinged together. This system is by no means

new, but what is novel is the idea of a movable lens. Although the camera is a rigid one, it can be focussed so as to permit a near object to be rendered more or less sharp. This is done by means of a lengthened screw round the outside of the lens, one turn only of which will change the focus at least one inch. This little apparatus may prove useful to travellers, as it occupies but little room.

M. Léon Vidal made a communication on carbon printing, before commencing which he asked to be permitted to express the satisfaction he felt at finding himself among his colleagues, for whom he had ever felt the greatest sympathy and affection. He appeared to be at home among them, and, as it were, in the midst of his family. After having visited many photographers, during his short stay in Paris, he had obtained the certainty that the time was not far distant when processes for printing unchangeable proofs would become general among them, which was, indeed, to be desired. He thought the moment favourable for giving a few hints to those who had, and also to those who would hereafter, become the champions of the carbon process in order to guide them in their work, the manipulations of which were much more delicate than those of printing with silver salts.

It was to be remarked that temperature exercised great influence on the sensitiveness, or, rather, on the solubility, of the bichromates. The influence was such that solutions of a certain and fixed density when employed during the summer, would not serve as a base for exposure during the winter, and *vice versâ*.

A practical conclusion could be drawn from that observation, which was—that it would be well to employ a thermometer at the same time as the photometer, in order to judge in an absolute manner the time of exposure required.

M. Vidal then informed the members that in order to aid photographers and amateurs in carbon printing he had composed a table which gave the length of exposure required for every degree of temperature, providing the quantity of bichromate in the solution were always the same. This table gives the time of exposure required when the bath contains from one per cent. to six per cent. of bichromate of potash, at any temperature from 32° to 86° Fah.

I am happy to inform the readers of The British Journal of Photography of these, I must confess, most important calculations, as the greatest drawback to carbon printing has been the difficulty of calculating the time required for exposure. M. Vidal informed us that a practical manual would be published ere long on carbon printing, which would contain that table. I will give my readers the address of the editor as soon as I hear that the book is in print.

"Are carbon proofs subject to deterioration?" is a question very often asked, and it is a problem which it is necessary to solve. Evidently the carbon itself is indelible, therefore only one cause of destruction is possible—that is, the separation of the carbon from its support or pellicle. This occurs sometimes when the operator places the developed picture upon the final support, when the two surfaces are submerged in water, the temperature of which is too low. The gelatine film is forced to adhere for a short time by atmospheric pressure; but the air, penetrating slowly the pores of the paper, destroys the vacuum, and the film which holds the carbon rises from the support.

It is very easy to prevent its doing so by keeping the water bath at a temperature of 59° Fah.; the gelatine is, by this means, not only swollen, but its surface is partly dissolved, and the adherence takes place between the two surfaces—not by the simple effect of the vacuum, but in a solid and durable manner.

M. Vidal then expressed his gratitude to the Society for the gracious manner in which it had received his former communications on photochromy. Since that time, he said, great progress had been made, and he had the hope that ere long he would have the honour of offering them some pictures worthy of their serious attention. He had then the pleasure to inform the Society of a piece of news which might be considered of great importance in connection with the progress of photochromy. He said that M. Paul Dalloz had taken the initiative and was going to commence photochromic printing under his direction. He added that a new era had begun for photochromy, and he had the conviction that ere long coloured photographic pictures would be as easy to procure as those now printed with silver salts.

I am certain that all the readers of The British Journal of Photography will join with me in wishing success to such a distinguished amateur. Space prevents me from giving the remainder of M. Vidal's communication on his photometer, but I propose to do so in my next.

*Paris, April* 5, 1875. E. Stebbing, *Prof.*

## PHOTOGRAPHIC GRATITUDE.—THE LATE MR. SUTTON.

*To the* Editors.

Gentlemen,—Professor Stebbing alludes very courteously to me in his communication of last week. I ask permission, however, to say that I did not intend to convey any regret for having written so much on photographic matters; on the contrary, it has been a great pleasure to me, and has gained me some valued friends. But I feel, and I know that many feel with me, that of late things have changed, and amateur writers who write and publish solely for the benefit of the photographic public have ceased to find the fair treatment they used always to have accorded to them.

More distinction is to be gained nowadays by simply taking what another has previously published, and writing a long article, ignoring the previous worker; or, better still, by taking the said published formulæ and endeavouring to secure them by patent. Both of these I consider grossly unfair, and do not care to hide my opinion. Encouragement given to such acts as these do injury to photography and alienate many who have its welfare at heart.

I cannot close without a few words *in memoriam* of our friend Thomas Sutton. In 1860 I returned to England from India full of delight at having had great success with dry plates prepared with gum arabic as had just been suggested by Mr. Hardwich, and, not having one single photographic acquaintance, sought out the professor at King's College. This was Mr. Sutton, and his kindness and courtesy to me were most charming, and from that period to the time of his decease we were in constant friendly correspondence. I regret his death most sincerely, and I wish to ask my brother photographers whether they are inclined to join me in doing something to honour his memory.—I am, yours, &c.,

*April* 5, 1875. H. Stuart Wortley.

## THE BEER AND ALBUMEN PROCESS.

*To the* Editors.

Gentlemen,—I do not want to get into the grasp of our monthly friend the "Peripatetic Photographer," but will he kindly inform me by what process of reasoning he has been led to designate the "beer and albumen process" by the name of "Captain Abney's process?" Is it, or is it not, a fact that this process was published many years ago by Mr. W. H. Davies, of this city? and is it, or is it not, a fact that Captain Abney's modification of it extends only to altering, in a slight degree, the relations in which the beer and the albumen exist in regard to each other? Will Mr. "Peripatetic" answer these questions, if he can?

But I am a man of peace, and have no desire for a "set-to" with that "free lance" of your Journal; in fact, I write solely for the purpose of endorsing some valuable assertions he has made in the guise of a question relative to the effect the chlorides and other adulterations in ale or beer exercise on the sensitiveness of the plates preserved thereby. About the time at which his acute observations must have been passing through the press that very subject—the adulteration of ale—was being discussed at a meeting of the Society of Arts. In the course of an able paper by Mr. Wentworth L. Scott, public analyst for Derbyshire and North Staffordshire, *On Food Adulterations*, that gentleman is reported to have said that in his district, and in connection with ales, about sixteen convictions had been obtained for the worst cases, some half-dozen of which were for adulterating ale with *cocculus indicus* in addition to salt and other flavouring matters. A licensed victualler at Tutbury, near Burton, was convicted of selling ale much adulterated with salt and *cocculus indicus*, and brandy which had been first "lowered" with water, "fortified" with common spirit, and, lastly, had had a fictitious strength imparted to it by means of some preparation of cayenne pepper. Five or six convictions had been obtained under his certificates for the adulteration of beer with *cocculus indicus*, and one where the most pernicious ingredient present was found to be some preparation of colchicum. At Hanley, some bitter ale was submitted to him containing picric or carbozotic acid and a large proportion of common salt; but the prosecution herein was futile, through the proper notice of purchase not having been given. Malt and hops were supposed by the public to be the sole materials from which beer could be legitimately produced, with the exception, perhaps, of saccharine or grape sugar, now allowed under certain restrictions to be used in connection therewith; but if beer was also to contain a whole host of astringent bitters in order to further increase the profits of a very powerful class of traders whose incomes are generally amongst the most certain, at the expense of another section of the commercial world whose annual takings are necessarily very uncertain indeed, and to the serious although gradual detriment of the digestions of Her Majesty's lieges, then such multifarious decoctions of quassia, gentia, chiretta, calumba, camomile, oak-bark, barberry-root, bitter ash, *et hoc genus omne*, should be sold as such, and not be allowed to delude all thirsty souls in the garb and under the respected name of "John Barleycorn."

Now, in the light of such revelations is it not time—I ask with the "Peripatetic"—to discard commercial beer from the list of photographic *chemicals*, and in place of it try to secure something of the composition of which we *are* aware.—I am, yours, &c., Caledonia.

*Edinburgh, April* 6, 1875.

## EXCHANGE COLUMN.

Wanted to exchange, a Dallmeyer's stereo. lens (Wilsonian), one and a-half inch diameter and six inches focus, for a Ross's 5 × 4 A doublet, nearly new. —Address, J. Warburton, Fairlie Villas, Wellington-road, Fallowfield, near Manchester.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

Photographs Registered.—

R. Thompson, Liverpool.—*Two Portraits of Father Nugent.*

O. C. Smith, Stroud.—*Portrait of Samuel Stephens Marling, M.P.*

James Armstrong, Carlisle.—*Side View of Greyhound "Honeymoon."*

Frank W. Micklethwaite, Newry.—*Four Views of the Grave of the late John Mitchel.*

Omicron.—We must decline to give our opinion of the validity of a patent to an anonymous correspondent.

B. W. J.—The scum may be removed from the silver solution by drawing over the surface a straightly-cut piece of clean white paper.

A. P.—Bromides are formed by the combination of a base with hydrobromic acid, which is an acid compound of hydrogen and bromine.

Robert Taylor.—The number has been out of print for several years; but you may refer to a file of the Journal at our publishing office.

Lex.—If you address a letter to the editor of the Almanac, care of this office, he will receive it. Hence it is unnecessary to give you his private address in this column.

Venator.—The solution is too strong. You will obtain far better results with a bath containing no more than thirty-five grains of silver to the ounce. We shall be glad to hear from you again.

Mother Redcap.—We are unable to say which tent or developing-box is the best. Purchase the one most likely to suit your requirements, and then make any alteration on it you may consider desirable.

Z. Z.—Should we hear of anyone likely to suit you we shall write. But we advise you not to make your want known by advertisement, or else you will become a target for numerous shafts. We shall respect your confidence.

W. F.—Lea's *Manual* is the most comprehensive modern work on photography; but the manuals issued by Hughes, Abney, Stillman, and several others are also excellent, and from any of them you will obtain the information of which you are in quest.

Collodion.—Send us a sample of the cotton you have been using, or if it be a commercial article let us know from whom, and under what name, it can be obtained. We shall thus be enabled to ascertain in what direction the iodising formula should be modified to suit the pyroxyline.

Photolitho.—The following proportions will answer:—Bichromate of potash, one ounce; Nelson's gelatine, one and a-half ounce; water, twenty-five ounces. See remarks in one of our leading articles concerning the use of albumen for producing photolithographic transfers.

B. Blackadder.—One hundred grains of bichromate of ammonia contain the same amount of chromic acid as a hundred and sixteen grains of bichromate of potash; and these in turn are respectively equivalent to a hundred and fifty-three grains of the neutral chromate of potash.

Oldham.—Of the two lenses named we are able to speak of one only—that marked "B"—from personal knowledge. We find it to be so good and useful that we should not like to be without it. At one time we thought it was an exceptionally good one of its class; but we have since seen several others of the same kind by the same maker, and all were equally good.

J. D. C.—We can account for the stains, or rather the inequality in the skies of the negatives, only on the supposition that the developer has not flowed smoothly over the surface of the plate. By adding a little alcohol to the developer this defect will be remedied. But we advise you not to add more alcohol than is sufficient to make it flow, for in your case an excess of alcohol would prove injurious.

W. S. Lee.—The surface of glass can be easily ground by laying the plate upon a bed of cloth or other soft material, and, after sprinkling it all over with fine emery and water, rubbing it thoroughly by means of a small piece of glass to which a cork has been affixed by sealing-wax so as to form a convenient handle. The coarseness of the grain thus obtained will depend entirely upon the coarseness of the emery employed in the operation of grinding.

A. Z. (Burdett-road).—In order to discover whether methylic alcohol is present in any sample of ether or alcohol, place a little of the suspected liquid in a tube retort and distil it over into a cooled test tube, and after adding two or three drops of a very dilute solution of chloride of mercury to the distillate, followed by the addition of an excess of solution of caustic potash, shake the whole. If the precipitated oxide of mercury does not redissolve, even on warming the liquid, wood spirit is not present. Be careful not to add too much of the mercurial solution.

Rev. J. Hill.—It is about nineteen years since Dr. Hill Norris obtained his patent for the mode of preparing dry plates adopted and carried out commercially by him. While we do not know the precise details of his method of procedure, we may state that the collodionised plate, after being sensitised and washed, was immersed in a solution of gelatine in a warm state; but the use of solutions of gum arabic, dextrine, starch, albumen, tragacanth, caseine, gluten, and other bodies of a similar nature was also embraced by him in his specification. We quite agree with you in your estimate of his plates; some that we tried many years ago produced very fine negatives.

Received.—G. W. Webster, F.C.S.

Cadmus.—Thanks for the thoughtful care and trouble involved in your enclosure; but the mere announcement of the accident, unless accompanied by such details as would ensure immunity from a similar fatality, will scarcely prove profitable. For the benefit, however, of our readers we give an extract from the enclosure referred to, which is to the effect that "a lamentable accident occurred at 9, Tritonville-road, Sandymount, Dublin, on Thursday evening, which terminated fatally on Saturday morning. It appears that on the former night, about eight o'clock, Mr. James S. Marsden was engaged with a small retort at the kitchen fire manufacturing gas which he intended to use in connection with a magic-lantern exhibition to take place in the school-house on the same evening. In the course of the passage of the gas from the retort through the purifier into a bag which served as a gasometer it exploded with a loud report. Mr. Marsden received such severe injuries that he died on Saturday morning at six o'clock. Mrs. Marsden was also badly hurt. Two of their children were in the kitchen at the time of the occurrence, but happily they met with but trifling harm. The kitchen grate was torn out of its position, the ceiling was considerably damaged, and the furniture destroyed." The case appears to us to be a very simple one—a subject in connection with which many notes of alarm have been sounded in this Journal. When a retort containing the preparation for making oxygen is too full the ebullition becomes so violent as to force some of that preparation into the escape pipe, which, when thus choked, causes an explosion. A high top and a wide exit tube will ensure safety.

New Catalogue.—We have to thank Mr. Chas. W. Stevens, of Chicago, for his new catalogue of photographic appliances. This elegant catalogue, of 140 pages, with its gilt edges, morocco cover and gold lettering, attests the enterprise of our American friends.

"Imperial" Portrait.—Messrs. George Mason & Co., Glasgow, has sent us a charming specimen of the new "imperial" portrait, by Mr. Abel Lewis, of Douglas, Isle of Man. It may interest both donor and artist to know that several photographers who have seen it lying on "our editorial table" have expressed their unqualified delight with it, and most justly so. The print is cut to $8\frac{1}{2} \times 6\frac{1}{4}$, the mounting-board being 10 × 7 inches.

Destructive Fire.—On Saturday, the 27th ult., a fire was discovered in the warehouse of Mr. M. P. Tench, Fleet-street. Before the conflagration was mastered much damage was done to the stock, a portion of the instruments forming the intended outfit for the Arctic expedition being among the articles destroyed. The manufacturing department escaped uninjured, and the usual course of business has not been interrupted. Previous to the time the fire broke out the premises had been closed for two days. The origin of the fire remains undiscovered.

Enamelled Trays.—As respects durability and cheapness iron possesses very great advantages over porcelain or glass as a material out of which to form photographic dishes or trays. We do not, of course, mean iron in its pure or unsophisticated condition, but that metal after it has had its surface properly protected by a substantial coating of thick vitrified enamel. A specimen of such dishes we have received from Mr. Werge, of Berners-street, who has had them constructed of various dimensions for the purposes of toning, fixing, and washing. So substantial does the enamel appear that we should have little hesitation in using these dishes for silver solution; while for evaporating solutions by the aid of heat enamelled iron dishes of this kind have much to recommend them.

Rejlander Memorial Fund.—We again beg to call the attention of our readers to the announcement which appears in the present number in connection with the Rejlander memorial fund. The reasens for instituting this fund have been already fully explained, and it now only remains for the friends and admirers of the late Mr. O. G. Rejlander to forward their contributions as early as possible. Let it be remembered that "he gives twice who gives quickly." We are glad to see that the Liverpool Amateur Photographic Association has made a move in furtherance of this excellent object. Contributions may be forwarded to the Editorial Office of this Journal, 2, York-street, Covent-garden, W.C., made payable to J. T. Taylor, or to Henry Greenwood, 32, Castle-street, Liverpool.

## METEOROLOGICAL REPORT,

*For the Week ending April 7, 1875.*

Observations taken at 406, Strand, by J. H. Steward, Optician.

These Observations are Taken at 8.30 a.m.

| April. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 1 | 30·54 | SE | 45 | 49 | 54 | 47 | Dull |
| 2 | 30·49 | NW | 42 | 46 | 56 | 45 | Dull |
| 3 | 30·03 | W | 42 | 45 | 54 | 42 | Dull |
| 5 | 29·30 | SW | 45 | 47 | 56 | 46 | Dull |
| 6 | 29·44 | W | 44 | 47 | 56 | 42 | Cloudy |
| 7 | 29·35 | W | 39 | 40 | — | 39 | Cloudy |

CONTENTS

THE BRITISH

# JOURNAL OF PHOTOGRAPHY.

No. 780. Vol. XXII.—APRIL 16, 1875.

## THE CHLORIODO-BROMIDE PROCESS.

We are now in a position to lay before our readers the results of our experiments with the new emulsion process introduced a few weeks since by Mr. M. Carey Lea; and here let us state distinctly that it is *not* his new process given in our last number, which we have not yet tried. We have followed throughout the formulæ and instructions given by Mr. Lea at page 122, strict attention having been paid to the minutest details in order to give the process the fairest possible trial. That our experience does not agree with that of Mr. Lea in every respect will not be wondered at by those of our readers who are in the habit of experimenting in photographic chemistry; but any little differences may be easily explained, probably, by the fact that the collodion used in our trials was of necessity newly made, while that used by Mr. Lea was some months old.

Having prepared a quantity of bromo-iodised collodion according to the formula given, a portion of it was sensitised with eighteen grains of silver nitrate to each ounce. The silver was dissolved in alcohol by means of heat, and was added very gradually to the collodion, with much shaking. The first addition produced almost instantaneously an emulsion of a fine, clear, orange-brown colour, and of a much deeper tint than an ordinary bromide emulsion; but the subsequent additions gradually destroyed the clearness, though the colour continued to deepen until probably a little more than half the silver had been used. Here the iodide of silver commenced visibly to clot together and separate from the collodion, until, by the time the whole of the nitrate had been used, the emulsion appeared to be totally useless. Bearing in mind the instructions given to shake well for two minutes we did not despair; the shaking, however, only seemed to make matters worse, the sensitive salts showing even greater tendency to deposit. After nearly half-an-hour's shaking a few drops of the emulsion were poured on to a glass plate, producing a coarse, granular film, totally devoid of the rich colour so noticeable at first. The cupric chloride was then added and the shaking resumed. Matters now began to look a little better, the colour gradually returning, but the iodide showed no tendency to emulsify. Up to this time the shaking had been almost continuous. The mixture was allowed to rest for about an hour, when, to our astonishment, the clotted appearance was gone, though the emulsion still retained a dull look, showing that complete emulsification had not yet taken place. After another vigorous shaking it was set aside until next day, when, after filtering through sponge, it gave a beautifully-clear, dense film, without any appearance of granularity, and of a much richer brown colour by transmitted light than any bromide emulsion we have before seen.

Another portion of collodion was then sensitised with twenty-five grains of silver nitrate to each ounce, having been previously acidified with *aqua regia*. We may here state that we departed slightly from Mr. Lea's instructions in omitting the addition of tincture of iodine. Our reason for doing this was that the *aqua regia* more than fulfilled the purpose for which the iodine is used, changing the colour of the collodion—not to a pale sherry tint, but to a deep brown—giving it the appearance of iodised collodion some years old. This is a feature we have never noticed in connection with simply bromised collodion; indeed, we have since repeated the experiment, using the same acid and a sample of collodion bromised with cadmium and ammonium, but no change of colour took place.

This emulsion behaved in a similar manner to the former one when the silver was added only that it looked even more unpromising, the cupric chloride apparently having no effect upon it as in the other case. Shaking was of no use, and it was only by letting it rest for some time, shaking at intervals, that it was coaxed into working order. It is noticeable that shaking continuously produces less effect in re-emulsifying the iodide than the system of intermittent agitation. We are, indeed, inclined to think that prolonged agitation is not an advantage, but the contrary. It is necessary in all cases to filter the emulsion carefully before use, as a considerable portion of the iodide retains its coarse formation to a degree scarcely amounting to granularity, but still sufficient to give a dull, unsatisfactory look to the film. This may probably disappear with time, but it is questionable if the other properties of the emulsion will remain unimpaired sufficiently long to admit of its being kept until perfect clearness is obtained.

Plates were prepared with these two emulsions, three different preservatives being used, viz., Mr. Lea's compound of gum, albumen, sugar, gallic acid, and tannin, a mixture of coffee and gallic acid, and the tannin, gallic acid, and grape-sugar mixture employed by many operators in this country. The first of these we experienced great difficulty in making, utterly failing in the production of anything like a clear solution, though we followed Mr. Lea's directions to the letter. The best result of three attempts was a creamy-looking mixture which refused to pass through the filter, and which we were compelled to wash off before drying the plates. The remaining two preservatives formed perfectly clear solutions. We should state that to each of them was added one drachm of glacial acetic acid to four ounces of solution.

The plates were tipped with solution of india-rubber and coated. When fairly "set" they were plunged direct into the preservative bath, and allowed to remain there for six or seven minutes, then drained, and dried by artificial heat. Very little difference was observable between the plates prepared with the various organifiers, but those made from the emulsion containing free bromide possessed a noticeably brighter surface by reflected light, the others exhibiting a slightly dusty, dead appearance, inevitable with excess of silver. The colour of the films by transmitted light was of a more non-actinic character than the ordinary bromide ones, being of a deep orange-brown. No backing was employed, and, so far as we have gone, not having put the plates to a severe test, there appears to be no necessity for it.

The development recommended by Mr. Lea will strike English readers as being very much weaker than is usually employed in this country even by those who prefer the weaker form; but with these plates it appears to work much better than a stronger one. This may probably arise from the presence of a large proportion of silver chloride in the film, that salt, as is well known, being more easily reduced by alkaline pyro. than the bromide, while iodide, on the con-

trary, requires a much stronger solution. This inclines us to think with Mr. Lea that the iodide *per se* is not the main cause of the difference in the action of the new emulsion, but that it is rather due to a combination of iodide and bromide, and probably also chloride. The colour is also very different, and can scarcely be accounted for by the presence of the small quantity of iodide which appears to enter into the emulsion.

The development of the plates was commenced by the usual wash of diluted alcohol. This is, we fancy, contrary to Mr. Lea's practice, as he makes no mention of it in his directions; but the result is so greatly in favour of the plates that we adopted it as an improvement. After washing off the alcohol the film was treated with a one-grain solution of pyrogallic acid, to each drachm of which we added two drops each of an eighty-grain solution of ammonium carbonate and a fifteen-grain solution of potassium bromide, this corresponding as nearly as possible with Mr. Lea's formula. Even with the shortest exposures the high lights appeared very rapidly under this treatment, the details coming up more gradually with perfect clearness and entire freedom from fog. The first or second addition of ammonia, with a proper exposure, produced in all cases sufficient density. We have not yet had occasion to resort to silver redevelopment.

The action of the different organifiers is very noticeable. The albumen compound to which Mr. Lea gives the preference proved, in our hands, the least satisfactory as regards cleanliness of working and facility in obtaining density. In reporting this result we must remind our readers that the preservative was washed off—a course of action which tends to the production of such a result. The other two preservatives were decided improvements, the coffee and gallic acid proving slightly the better. The *colour* of the tannin, gallic-acid, and grape-sugar images is, perhaps, the one which would please the eye most, as it closely resembles a good wet plate.

In point of sensitiveness the emulsion made with excess of soluble bromide would not compare with an ordinary emulsion (also made with excess of bromide) against which we tried it, but it developed more rapidly and came up to printing density with greater ease. No difference in rapidity was exhibited by the various preservatives. he more rapid emulsion was tested against a wet plate, various exposures being given—from ten seconds to ninety—the wet plate requiring fifteen. The albumen plates proved the most rapid, coffee coming next in order, being only very slightly less sensitive. There was, however, a marked difference between the wet plate and the albumen ones, twenty-five seconds being necessary to produce a result equal to the wet. The only effect of increasing the exposure, up to ninety seconds, was to slightly change the colour of the deposit, equally good pictures being produced, showing a great elasticity in the matter of exposure.

Our general opinion of the process is that it will prove useful in dispensing with the objectionable "backing" now used with dry plates, except under very trying circumstances. The sensitiveness is very good, though we have not found it so great as Mr. Lea states, and the general behaviour of the plates is satisfactory. There appears to be no element of uncertainty about it, unless it be the constant change in the composition of the preservative bath by the introduction of free silver with each plate. Speaking of the preservative, we cannot help thinking it a mistake to recommend so complicated a bath as the compound albumen mixture of Mr. Lea. Independent of its doubtful composition and messy nature, we think one-half of the ingredients would perform the work as well.

We have not yet had time to fully try the application of this method to Mr. Bolton's washed emulsion process, but are now engaged in the necessary experiments, which will be reported on in due course.

## AN EFFECTIVE METHOD OF ENLARGING.

Among the various methods of enlarging, either suggested or carried into practical operation, that explained by Mr. V. Blanchard at the recent meeting of the London Photographic Society is, from its very nature, certain to be received with as much favour by our readers as it was by those who were present on Tuesday evening and heard the paper read and examined the various specimens exhibited. Premising that no claim is to be made for novelty—for Mr. Blanchard said that it was not really new, although when he commenced to write his paper he imagined the method to be so in reality, as it certainly was to him—we now give an outline of the process in question. The paper in full will appear next week.

From a small negative an enlarged transparency on glass is obtained by the collodion process. The method of obtaining such a transparency is so well known to our readers as not to necessitate our giving full details. The negative, which has been placed against a well-lighted sky or other evenly-lighted backing, is copied by means of any good lens capable of working sharply, the degree of enlargement being made to suit the requirement of the photographer. This enlarged transparency is to be fully exposed, so as to possess every bit of detail existing in the small negative; and it must be a strong one, to permit its being used as a *cliché* in the printing-frame. If there be any spots or defects, the pencil or brush may be used freely in removing them.

Here, then, we have obtained an enlarged, intense transparency. The next step is to place this in the printing-frame in contact with a sheet of ordinary sensitised paper, either plain or albumenised. A paper *very slightly* albumenised is found to give the most pleasing results. When this is exposed to the light the image printed upon the paper is not a positive but a negative, owing to a transparency being used as the *cliché*.

The printing must be carried very deep; this is of importance both as serving to secure all the detail, and also because of the lowering of the image by the subsequent operations. Fixing in hyposulphite of soda follows, the toning being omitted for obvious reasons.

The paper negative which is the result of these operations possesses a fine red colour, which is very non-actinic and favourable to the production of bold, vigorous prints. But as paper is dense and stops much light it is desirable, if not necessary, to impart to it some degree of translucence, for which purpose the negative is laid upon a hot plate or other surface, and is rubbed with white wax, which melts, fills up the pores of, and renders translucent, the negative thus treated, the superfluous wax being removed by blotting-paper.

A negative prepared in this manner is now ready to be used in the printing-frame for the production of positive proofs, and from the fact that this new negative is upon paper the opportunity is afforded to those so inclined of touching or working it up in a much easier way than could be effected upon a glass negative. Proofs printed from a paper negative of this kind possess the quality so characteristic of the fine calotype or waxed-paper negatives of olden times, owing to the texture imparted by the paper.

We close this hasty sketch of a useful process by again stating that no claim is made on account of its novelty, inasmuch as it was published some years since. If, however, the attention now directed to it be instrumental in bringing it more generally under the notice of photographers much real good will have been secured.

## PINHOLES IN NEGATIVES.

Notwithstanding the marked degree of progress made in matters relating to photography there are still "spots upon the sun" of that advance—small dead flies, causing the otherwise precious ointment to stink. Among these annoyances pinholes in the negative are entitled to a conspicuous place. Much has been written on this subject, and, doubtless, much more will yet be written. At present, although much light has been thrown on the origin of the disease, it is still, to a great extent, involved in obscurity. It is a matter for congratulation that remedies for this evil exist, notwithstanding the fact that both their action and their primary cause are not as yet clearly apprehended.

At the last meeting of the South London Photographic Society Mr. York, who certainly has had an enlarged experience of the wet collodion process, pronounced in favour of the nitrate of barytes' cure for pinholes, suggested for this purpose by Mr. A. L. Henderson

more than two years ago. He had tried various remedies, including the *dernier ressort* of precipitating the silver; but, after several experiments with the barytic addition, he eventually concluded that in this agent he had found a specific for the prevention of pinholes. Feeling chary at adopting Mr. Henderson's remedy, because it was a soluble salt, Mr. York first of all tried the insoluble sulphate of barytes; but, as no satisfactory result was secured from its use, he then had recourse to the soluble nitrate, with unmistakable success.

Three negatives in illustration of this position were exhibited by Mr. York. The first was taken by the bath previous to being subjected to any remedial treatment; the second in a portion of the same bath after treatment with sulphate of barytes; and the third after a portion had been treated in a similar manner with nitrate of barytes. These three negatives are now in our possession and may be seen at our office. They present the following appearance:—The first is as thoroughly full of pinholes as the most ardent admirer of this kind of phenomena could possibly desire. The second—that which was taken after the treatment with sulphate of barytes—is similar to the former, clearly proving that however useful this salt may be for other purposes that of rectifying a disordered bath does not fall within the category. The third—the result of treatment with nitrate of barytes—is clean, brilliant, and free from pinholes and other defects.

With regard to the *origin* of pinholes—which must be investigated thoroughly in order to arrive at a satisfactory cure—claims are being advanced on behalf of sulphates and oxalates, in addition to the iodo-nitrate, or nitro-iodide, of silver, which we have all along held to be the true cause of the pinhole proper. When a bath is in the state designated "sandy"—that is, when it causes the collodion film immersed in it to assume a sandy appearance—it invariably produces pinholes in the negative. If the film be microscopically examined each sand point will be found to consist of a crystalline formation, which is neither the sulphate nor the oxalate of silver, as a speaker on Thursday evening observed. Certainly, in our experiments, which have been conducted with several baths, we did not discover either of these salts, although under other circumstances it is far from being impossible that not only the sulphate and oxalate, but also the fulminate, as suggested by another speaker, may be present. These crystals are decomposed by water into the iodide or bromide of silver, being, so far as we have seen, unaffected by alcohol. They are formed in a collodionised film when such film is subjected to the action of a silver bath that has been saturated with iodide of silver. The solution immediately in contact with the film yields up its silver to the halogens in collodion, and a portion of the iodide previously dissolved in the bath solution, in consequence of this weakening, crystallises in the film, forming a new compound, which is the nitro-iodide of silver. These remain in the film until the water of the developer comes in contact with them, when they suffer decomposition, being converted into iodide of silver, which is immediately dissolved upon the application of the fixing solution, leaving a clear, transparent hole.

The deposition of atoms of mere iodide of silver in or upon the film will not cause pinholes. Their dimensions are by far too small to do that, as may readily be ascertained by microscopic examination. Besides, if they were formed on or in the surface, they would only aid in the formation of the image, and under no circumstances would they form pinholes, even were they very much larger in size than they really are.

Seeing that nitrate of barytes acts as a remedial agent in the case of a bath giving pinholes, its action upon the formation of these double crystals will form an interesting theme for further examination.

In the course of conversation with Mr. Henderson with respect to the action of nitrate of barytes, that gentleman expressed the opinion that this character of pinhole does not arise from the supersaturation of the bath with iodide of silver. In favour of this assertion he advanced the argument that the best results with the nitrate of barytes bath were only obtainable when the bath was fully charged with iodide. In his own practice he always keeps a quantity of iodide in the funnel through which he daily filters his bath, and curiously enough finds that, although the silver solution day after day gets weaker by use, the iodide of silver in the funnel decreases in quantity, showing that notwithstanding the reduction of the strength of the bath, so far as nitrate of silver is concerned, its solvent powers on the iodide seem to increase. He suggests, as the probable *rationale* of the difficulty—at least as one worthy of attention—the following solution, namely, that iodide of silver becomes converted into *iodate*, which is soluble in ammonia and in nitric acid. An old bath doubtless contains ammoniacal salts and, in most cases, nitric acid in a free condition; and if the formation of iodate, at which we have just hinted, really take place, this leaves the bath in a condition in which it is ready to absorb more iodide. He finds, moreover, that an old bath that has been treated with barytes works with greater rapidity than a new one—subject, however, to what some might consider the drawback of the image being thin, although in nowise deficient as regards detail.

Here we leave the matter at present. While we feel quite certain as to the nature of the crystalline formation, as well as the decomposition to which the existence of pinholes is due, it is gratifying to learn that a cure for the evil is to be found in nitrate of barytes, even although that gratification may at present be clouded by our ignorance of the precise manner in which it effects the desired cure.

## ALCOHOL IN THE DEVELOPER.

The subject of an alleged reduction of the time of exposure in the camera by the addition of methylated spirits of wine to the developer occupied the attention of the members of the South London Photographic Society during a portion of their *seance* on Thursday, the 8th inst. Mr. Brooks having stated that he had found by such an addition that a gain of one in five of the usual exposure was obtained, the chairman—who, like the other members, was unable to speak in corroboration of this statement—very pertinently observed that a matter of this kind could very easily be ascertained by a direct experiment, and this experiment we have carefully tried.

Having prepared a protosulphate of iron developer of the strength of fifteen grains to the ounce, we added to it glacial acetic acid in the proportion of one ounce to twelve ounces of the iron solution. Three separate portions of this were now taken, to one of which we added a large proportion of a fine commercial sample of methylated spirits of wine; to the second an equal quantity of rectified spirit; and the third we left intact.

Plates were now collodionised, sensitised, and exposed under circumstances as nearly similar as possible, and the various developers employed. The result—arrived at after several trials—is that we are quite unable to confirm the statement referred to respecting the shortening of the exposure by the use of methylated spirit, but rather the opposite; for we found the best pictures to be those produced by the developer in which there was no alcohol of any kind. But between the pure and the methylated spirit there was no difference whatever.

We afterwards repeated the competitive trial, using pure methylic—not *methylated*—alcohol, prepared by Eschwege's patent process, along with the developer, the results, as respects the reduction of exposure, being simply negative as before.

We can see, however, how the introduction of alcohol in the developer may produce such an effect as might lead to the idea of its having the tendency alleged. When a bath begins to get disorganised owing to the abstraction of ether and alcohol from the collodion, the developer may have to remain on the surface of the plate for a short time before it "takes kindly" to it and effects the necessary reduction of the silver; whereas, by adding alcohol to it, the assimilation, penetration, or "mixing" is more readily effected, and the developer acts with greater energy. It is usually found to be a safe conclusion to draw that, when a developer ceases to flow smoothly over the surface of a plate without increased doses of alcohol, it is high time to subject the bath to such a course of treatment as will obviate the necessity for employing a stimulating agency. It will be found best to avoid the use of alcohol if the developer flow smoothly over the surface without it,

which it will invariably do if a small proportion of acetic acid be present, and if the bath be not charged with alcohol.

Mr. Hardwich, in his *Photographic Chemistry*, speaks quite to the point when he says:—"Sometimes an addition of twenty minims of alcohol to the ounce of developer will be an improvement when, from the age of the bath and accumulation of ether, the solution flows over the film in an oily manner. It is better, however, to dispense with the alcohol if possible;" and this is the opinion of the majority of our more experienced photographers.

## NEW AUTOMATIC CHANGING-BOX.

At the close of the meeting of the London Photographic Society, on Tuesday evening last, Mr. George Hare, of Lower Calthorpe-street, showed us a new changing-box he has just introduced, and in which are embodied several points, not merely of great ingenuity, but of great utility.

The old and well-known "Ottewill" changing-box, as it is usually designated, although really of French origin, possesses numerous points of excellence; but it has the serious drawback of necessitating several independent acts on the part of the operator, neglect of any one of which endangers the spoiling not merely of the particular plate that is being transferred to or from the box into the dark slide, but also every plate contained in the box.

To render the transfer box automatic in its action has been the object of Mr. Hare, who has succeeded in doing this in a most perfect manner. The aperture in the lid through which the plate passes from the box into the slide is closed by a metallic shutter, which is always kept *in situ*, by means of a spring, until the dark slide is affixed (by sliding on) for the purpose of being charged or of delivering up its charge, when, by the mere action of sliding it on, the aperture is thrown freely open so as to permit of the egress of the plate, the aperture being again closed by the withdrawal of the dark slide. The action is entirely automatic, and placed beyond the control of the operator.

With regard to the old Ottewill box, we know from sad personal experience that, even if it be locked and the key placed out of reach, the whole of the sensitive contents may be spoiled by the inspection of any prying friend who, admiring the workmanship, may feel an intense desire to pull out one or the other of the various sliding pieces seen to be there; but, with the "automatic" changing-box, steps so effectual have been taken to secure immunity from inquisitive friends that no ingenuity displayed even by the possessor of the box will enable him to open the passage so as to admit light, were he even desirous of doing so. The dark slide alone forms the key, and, being self-acting, the door of access to the plate is barred by the attempt to remove the slide.

Again: by the introduction of a flexible extending top the rigid subtop hitherto adopted in these boxes—and which when in action has always projected, causing an ungainly appearance in addition to its undoubted inconvenience—is entirely done away with. Here, when the top is slided so as to pass out any particular plate, there are neither projecting pieces at the sides called into action nor is there the possibility of the ingress of light.

We are glad to see so successful an effort made in the simplification of the *impedimenta* for dry-plate work, and do not doubt that such a plate-box as that here briefly described will meet with universal appreciation. We may add that the mechanical details connected with the dark slide are also of quite a novel character, one action sufficing to release the spring at the back of the plate and open the end of the slide to admit of its being transferred.

When we were, by a rather extensive series of experiments, making preparation for the last article we published on the application of the American hot burnisher, among the numerous prints we subjected to its action was a much-valued portrait of Mr. Mungo Ponton we had received from the Rev. Walter Whiting, by whom it had been taken. Much to our regret, this print proved the only exception to the unvarying success we had attained; for while all the others emerged from the burnisher with smooth, highly-polished surfaces, this one, alas! had its surface so entirely abraded as to be completely destroyed. We then remembered, although too late, that the print in question was a carbon one, whereas all the others were silver prints; and by a subsequent experiment we satisfied ourselves that carbon prints must inevitably be destroyed by the burnisher. But a remedy for this evil has been discovered by Mr. V. Blanchard, who has found that to ensure the same high surface, by means of the hot burnisher, on a carbon as on a silver print, all that is necessary to be done is that the print shall itself be made hot previous to its being dragged over the hot burnisher.

## POTASSIC PERMANGANATE AS AN INTENSIFIER.

[A communication to the Edinburgh Photographic Society.]

This question has been again brought under discussion in consequence of some remarks made by me in a paper read before this Society at a late meeting, in which I characterised the method of intensifying with permanganate of potash as unstable.

This remark has been called in question, both at the time of publication and since by the editor of the *News*, Dr. Vogel, and others, who hold such positions that what they say must be considered and replied to. In all matters of dispute the questions at issue must be settled by evidence; therefore a detail of my experiences with permanganate as a toning as well as intensifying agent may aid in a settlement of the case.

Some years ago I was engaged in getting up a quantity of transparencies, and, being desirous of giving them a rich golden brown tone, I experimented with a considerable number of toning agents, including gold, iridium and gold, platinum, palladium, &c., and finally got pretty near what I required in permanganate of potash. The colour was all I desired, and, although not completely under control as to uniformity of tint, it was in this respect at least as sure as any of the others. Another quality it possesses for this purpose is the clearing up of the transparent parts of the picture.

After a time I began to suspect that the colour of the transparencies was slowly but gradually changing, and I set to work to find whether this was so or not, and the why and wherefore thereof. A pair of test pictures were made, one of which was varnished and the other left unvarnished; these were exposed freely to light and air, being placed up against the windows of the glass-house, accompanied by another varnished one which had been gold-toned. The whole of these were wet collodion plates; and as a test another was made and treated precisely as the two first, but varnished and kept away from light, air, and variations of temperature, so far as that was possible to be done.

The lapse of a very few months sufficed to show that the first pair of pictures had sensibly deteriorated in colour and quality, while the gold-toned picture had not changed at all, or, if so, it was so little as to be unobserved.

The ratios of deterioration were greatest with the unvarnished plate, next with the varnished one, and least with that which had been shielded from light and air. This deterioration has gone on steadily ever since, until now the one unprotected by varnish is a mere shadow of its former self. This would have been tolerably good proof in most cases; but, fortunately or unfortunately, I was destined to receive a much more sudden, and at the same time absolutely certain, proof of the instability of the permanganate as an intensifying and toning agent.

On the occasion of the marriage of the Duke and Duchess of Edinburgh, about a year ago, I was asked to make two life-size transparencies of the royal couple on about 30 × 20-inch plates, which I did by the ordinary wet process, and finished them by what I then thought the finest method I had yet hit upon. The rich yet delicate brown tints were equalled only by the best mezzotints after Sir Joshua Reynolds, and in doing them I thought I had not only discovered "a thing of beauty," but that it would be a "joy for ever!" Alas! alas! I had not to wait a year, a month, a week, a day—no! only a single night—ere the beauty was flown for ever. The exquisite transparencies of today became, under the influence of burning gas and the heat generated thereby, a hopelessly, helplessly ugly combination of superoxide of manganese on a silver basis, together with the added products formed by four hours' combustion of good Edinburgh coal gas of twenty-eight candles value, and what that may produce who can judge? The examples are before you. You can see for yourselves how they have been destroyed, and you see also that these two samples have faded in spite of the varnishing.

I have not taken especial care over these examples of the failure of the per—— no, the superoxide of manganese as a stable intensifier of the silver image. It may be said that these experiences are of transparencies only. This I admit; but we all know that the conditions under which the respective images of the negative and transparency are produced are identical, both being made by the wet process, so that what holds good in one case will also hold good in the other.

There cannot be a doubt that varnish and complete exclusion from light and air does, to a certain extent, preserve the film of manganated silver, as in the examples I now show, which are prepared in the same way and varnished, rendered air-tight, and to a great extent kept in the dark except when in use in the lantern. These seem to have undergone no deterioration whatever; but that, I submit, is no proof of the stability of the permanganate as an intensifier. I may mention that I have another pair of test examples at present undergoing trial, on which some months hence I will bring up a further report. W. H. Davies.

## THE DIMENSIONS AND PROPORTIONS OF PORTRAITS.

For a considerable time I have been of opinion that the photographic world has had enough of formulæ and processes, those we possess being sufficiently good to enable any intelligent man to produce excellent results. We have, in fact, arrived at that stage of our progress when art-knowledge is necessary to carry out the methods which science and mechanism have placed in our hands for the production of pictures by the camera. The size and proportion of these pictures being of great importance must be my excuse for writing again on the subject.

Exception has been taken to some of my remarks on the new size. I therefore hope to be allowed to explain that I employ the term "lanky" to the boudoir size *only* when it is used for other descriptions of portraits than the whole length—the especial size for which it was designed by Mr. V. Blanchard. In talking with him on the subject I said the introduction of a new size which is only adapted for one description of portrait cannot but have a baneful influence upon photography, for many reasons—chiefly the difficulty most people experience in standing in a natural position during the length of exposure necessary in our miserable light; the few photographers who possess sufficient knowledge or skill to make a presentable whole-length picture; the dearth of natural, sensible, or pictorial accessories; and the absolute absence of properly-painted backgrounds.

These considerations will in a short time compel the great mass of photographers to abandon the whole-length altogether, and take refuge in half-length or three-quarter pictures, for which this new size is unsuited. Then publishers will ruthlessly cut down all photographs from 15 × 12 to 8½ × 6½, regardless of proportion or effect. Manufacturers will play their usual pranks with it, and alter the size in every way—make the top arched or elliptical-shaped, absurdly round off the four corners—in fact, every conceivable bad alteration will be made. Already some of my anticipations have been realised. I saw, for instance, a large figure, which I presume was originally 15 × 12, thrust into the boudoir size. The head was one-sixteenth of an inch from the top of the picture.

Permit me again to refer to the sizes of the canvases employed by the great painters, which I submit ought unhesitatingly to be adopted for photographic portraits. I would ask the manufacturers to consider the height of a man in comparison to his width, and say if it be necessary to have seven feet ten by four feet ten to represent a whole-length; surely a different and squarer size ought to be used when instead of six feet of length we have only two feet to represent. Reason, good taste, the teaching of all writers on art, and the works of all great artists teach this. Ignorance, custom, prejudice, and a mistaken greed of gain are against it.

From personal experience and knowledge I know how solicitous artists are with regard to the proportions of their pictures, and rightly so; for it is the true proportion of a picture—that is to say, its width with regard to its length—which enables an artist to make an excellent composition. It is the necessary width which affords him the space to give breadth and solidity to his pictures—which permits him to balance his masses of light and shadow, contrast, and support or carry out the lines of his figures; in fact, proportionate width is an absolute necessity to a fine composition.

The late William Essex, the eminent enamel painter, once told me that Sir Thomas Lawrence altered the size and proportion of a half-length picture six times before he pleased himself. My father, who also knew Sir Thomas, confirmed this by saying he had seen him add or take away a quarter of an inch from a large picture. Any one not wilfully blind would admit the importance of proportion if they troubled themselves to think on the subject, or would take a whole-length engraving from a great picture and proceed to cut it down to a half-length or head size, as is done by publishers and manufacturers to photographs. It is not a little strange that while the sizes of the glass employed in making negatives is in every case good, the finished result is false in symmetry and proportion—due to the malign influence of makers of frames and albums. I ask—How long will photographers tamely submit to this dictation? That a good album with three sizes would be a commercial success I have personal evidence and experience.

Many years ago—disgusted to see my pictures mutilated and the very part cut off on which I had bestowed my best efforts, viz., the width—I had twenty-five albums made with three *cartes-de-visite* openings or mounts proportioned to give the pictures the utmost importance. Filling one with pictures I submitted it to three of the photographers who happened to enjoy the greatest amount of public favour at the particular time. One and all approved, but gave mean and sordid reasons for not joining me in my efforts to introduce a good and sensible album. Placed on a table in my reception-room it attracted the attention of the first man of taste who called on me, who immediately desired to purchase a similar album. Very soon twenty were disposed of, and the purchasers, finding a difficulty in filling them, applied to me to supply my best pictures, suitably mounted. For years I felt the favourable influence of those albums, and for years people came to me in consequence. They were the best possible advertisement I could have had.

About the same time I induced a manufacturer to supply me with toned mounting-cards. He hesitated, and warned me they would not be liked; but from the time of their introduction I have scarcely seen a white mounting-card. I mention these instances to show that a good thing has only to be seen to be appreciated by people of cultivated taste, who, sooner or later, influence the masses.

Robert Faulkner.

## MY LATE EXPERIENCE.

[A communication to the South London Photographic Society.]

The subject I have selected is the old, old story, the management and formulæ of our everyday life—a subject which, I think, will remain for many more years to bother us, although we have been informed on all sides for the last five years that the time is not far distant when the silver bath will be a thing of the past. My impression is that many thousand gallons of silver baths will have to be "doctored" before that time. We see a startling advertisement—"Away with the silver bath, and use dry plates." I am disposed to think this firm's motto is—"Do as I tell you, and not do as I do." This circumstance is pressed home more closely by our friend Mr. Kennett, who is going to show us the future by practical demonstration. This process, like all others, will have to be worked out by some painstaking amateur; for the business man is too much absorbed in other occupations to devote much time to experimenting, unless in a secret process, which seems all the rage at present.

The title I have given to this paper is *My Late Experience.* I will commence with the glass used. I have abandoned patent plate, and now use British flatted crown up to 8 × 6, and for larger sizes machine-polished sheet, which is a very good substitute for patent plate, at one-third its cost. The process of cleaning is one recently recommended in the photographic journals—to use a paste of whiting or rouge, allowing it to get thoroughly dry on the glass, and then polishing it off with absolutely dry leathers. I have never once had a streaky plate, which I have often noticed when polishing immediately after using a wet paste, which I used to attribute to dirty cloths or leathers. I have tried albumen in various ways, by coating a wet plate, and applying it to a dry plate; there is such a degree of uncertainty about it that I have discarded it, except to put it round the edges of the glass to keep the collodion from splitting.

There are so many excellent collodions in the market that to give my formula would be superfluous. I iodise a Winchester quart at a time, and always keep one in reserve ripening. When the one in use is empty I take the ripe collodion into use, and refill the other, which is set aside until required. I find this ensures clean work. I am not in the habit of adding additional bromide for particular subjects. I only use one and a-quarter grain to the ounce, although three grains are generally recommended. I do not notice any increased advantage, even for interiors; but I notice one great disadvantage—a more rapid deterioration of the silver bath. Those who used to work simply iodised collodion and pyrogallic developer must have noticed that the baths now get out of order much quicker than they did formerly. I remember, when first experimenting with bromo-

iodised collodion and iron developer, I could never get satisfactory pyro. negatives from a bath that had been used with collodion containing bromide.

This brings us to the third part of the process—the much-maligned silver bath, "the source of all our woe," as the late Mr. Rejlander expressed it; many will remember his delighted expression when the announcement was made that it was to be discarded entirely. The system I have adopted will appear rather troublesome, but to me it is a saving of time. In making a new bath I always neutralise it with oxide of silver, put it in the sun, and, when filtered, add two drops of nitric acid to each pint of twenty ounces. I have four Winchester quarts. I use one a week only, and I then pour it into the evaporating dish, boil for a few minutes to get rid of the spirit, neutralise with oxide of silver, fill up the bottle with distilled water, add silver to make it up to its original strength of thirty-five grains to the ounce, and put it out to sun. This bath now has a rest, and, when filtered, eight drops of nitric acid are added. I never think of taking a trial plate, so reliable is the plan. At the end of the season they begin to show signs of getting sandy; I then reduce them by Captain Abney's process, and make new baths out of old ones. I am disposed to think that I shall now save myself that trouble, and adopt Mr. A. L. Henderson's recommendation of adding nitrate of barytes to a sandy bath, which certainly is most effectual. I have tried it with a useless bath giving myriads of pinholes, and it had the effect of entirely removing this objection. I was reluctant to adopt it, being a soluble salt. I was in hopes sulphate of barytes would have answered the same purpose, but it does not. I submit plates from the same sandy bath treated both with sulphate and nitrate. You will perceive the sulphate has no effect—the bath is the same as before; but with the nitrate the objection is entirely removed.

I am not able to explain its action, and trust it will provoke a discussion that we may know the chemical effects of this most useful addition to the photographic laboratory. I do not think we have yet arrived at the cause of a sandy bath. We naturally conclude it is from excess of iodide, as it seldom shows itself until the bath has been in use some time. My own impression is that it is not iodide (possibly a nitro-bromide), for the crystals found adhering to the sides of the bath and bottles are insoluble in a solution of iodide of potassium. The precipitate formed by the addition of nitrate of baryta is not effected by exposure to sunlight. And, again, I have strengthened an old bath working well, and the next day the plates have been covered with myriads of pinholes. I am anxious to know why this occurs, because it is opposed to the theory of supersaturation. Strengthening a bath ought to retard, and not facilitate, this change. I hope our worthy Vice-President, Mr. Spiller, will be able to enlighten us a little on this most important subject.

I have very little to add respecting the use of the bath. I find that in taking interiors the plates are better for being only a short time in the bath—just sufficiently long to remove greasy lines—and then well aired, by resting on the dipper, and finally redipping two or three times in the bath. It is also very important, in order to prevent stains, to pack it well with blotting-paper to absorb all the superfluous solution. I am rather extravagant in its use, as it preserves the carriers and clothes, and prevents stains where working. The following incident occurred at the Albert Memorial in 1872, when the place was swarming with photographers:—I always worked there very early—in fact, the earliest—and the police in charge made me clean up all the stains made by others the day previous before allowing me to commence.

We have now arrived at the development. This is a subject to which I have given great attention. My experience is at variance with many eminent men. I prefer simply sulphate of iron, with a small quantity of acetic acid. My plan is to make it in a concentrated form, so that one drachm mixed with seven of water makes an ounce of developer. The advantages are—simplicity in mixing as required, and uniform action; for it has undergone the so-called process of ripening, which many regard as valuable for clean pictures. The proportions are as follow:—

| | |
|---|---|
| Water | 3 parts. |
| Acetic acid | 1 part. |
| Saturated solution of sulphate of iron | 4 parts. |

In summer I use one drachm to the ounce; but for interiors, and in cold weather, I use two drachms to the ounce, together with spirit of wine *quant. suff.* The proportions of this developer are about twelve grains of sulphate of iron and seven drops of glacial acetic acid to the ounce of water. I prefer using distilled or boiled water, or water in which a few grains of nitrate of silver to the gallon have been added, as I have traced pinholes, similar to a sandy bath, to hard water; for after-development I still use the pyrogallic and citric acid before fixing, and acetic pyro. after fixing. In the latter case I always flood the plate with iodine, to prevent stains, which occur very frequently if not thoroughly washed after fixing. It is most important to use a dilute solution of cyanide after intensifying with acetic pyro., or the negatives will, in time, turn brown and get so dense that they are useless. I always use cyanide for fixing, as I am reluctant to carry hypo. about.

In conclusion: I should like to call your attention to the most perfect non-actinic glass I have ever met with. It is prepared from an alcoholic solution of aurine mixed with collodion, the glass being coated in the ordinary way, and afterwards varnished with diluted carriage varnish. I did not get favourable results by dissolving aurine in spirit varnish; the results were not transparent.

The principal object of this paper is not to advance any crotchets of my own, but to touch on subjects with which we are all familiar, hoping to provoke an interesting and profitable discussion.

Frederick York.

## FOREIGN NOTES AND NEWS.

Meeting of the Berlin Photographic Society.—A Photographic Academy.—Krüger's Dead Varnish.—Rousillon's Process.—A Velocipede Tent.—Borlinetto's "Bismarck" Brown.—The "Photographische Mittheilungen" upon How to Make the Best of Things in Bad Weather.—Dr. Vogel.

At a recent meeting of the Berlin Photographic Society the question of the advisability of establishing an academy of photography at which young photographers might be trained was again revived. A member suggested that other scientific and artistic societies likely to be benefited by such an academy should be invited to co-operate with them in setting it agoing. The Chairman said he had already tried to interest painters in this project, but without success, and he feared that other societies would be equally unimpressed by its importance. It was finally resolved to let the matter drop until the approaching Berlin Photographic Exhibition had brought the want of such an institution more prominently before the public.

Herr Krüger, of Schwerin, showed some negatives retouched upon a dead varnish prepared by himself in the following manner:—One part of sandarac is dissolved in eight parts of ether; after the solution of the sandarac four parts of benzine must be added. The mixture should be allowed to stand until it becomes quite clear, and then it will be ready for use. The Chairman also showed some negatives varnished with this varnish; but they were not considered to have such an equal surface, nor to allow of being stumped so easily as those varnished after Herr Koch's recipe, which was given some time ago.

The President then showed a print from a copperplate produced by Roussillon's new heliographic process. We may here mention that Dr. Friedlander denies that this process differs in any material particular from Woodbury's. By Roussillon's process finely-powdered glass is mixed with a chromo-gelatine film, which is exposed under a negative and then treated with hot water in the same way as gelatine relief prints are usually treated. From this a plastic galvano-copper print is made, to which the powdered glass gives a fine grain. These plates can be printed from with fatty colours in the copperplate printing-press.

The President showed a *carte* portrait taken in December last by Sell's carbo-sulphuretted light with an exposure of about a minute. This *carte* was produced in order to prove that this light possesses sufficient chemical power by which to take portraits.

Herr Klinger sent a photograph of a tent mounted on a velocipede. He says that the construction of the tent is quite new, and he supplies a sample for approval. The price varies with the size. Herr Klinger's invention may be a novelty, but it seems to us that, however ingenious the idea may be, it is not a very practicable one. A velocipedist generally finds that he does very well if he take but a small knapsack with him, and would never dream of travelling any distance burdened by an unwieldly photographic tent. And if the operator ride on the velocipede with the tent, what becomes of the camera and all the other etceteras? Does the assistant ride on another velocipede with the camera, lenses, plate boxes, &c. depending from his girdle as the scalps of his enemies dangle from that of an Indian brave? And how are the velocipedes to get on when it is necessary to cross a moor or to pitch the tent amongst rocks?

Dr. Borlinetto has recently made some experiments upon the sensibility of aniline colours to the action of light. He coated starch, gelatine, and albumenised paper with these colours and exposed them to the sun's rays. The following results were obtained:—Hoffman's blue changed colour more quickly upon starch paper than upon gelatine or albumenised paper, and it was

the same with fuchsine, aniline green, and some others. The most sensitive colour of all was "Bismarck" brown. When exposed under a negative it gave a picture which allowed of being fixed by a solution of sulphate of iron containing a little alcohol. A very clear picture was obtained by the addition of "Bismarck" brown dissolved in alcohol to raw collodion, poured over a plate, dried, exposed, and fixed in the usual manner. Its sensitiveness, however, is not to be compared to that of silver salt, and its durability is greatest when organic matter is present.

The editor of the *Photographische Mittheilungen* tells us that during the winter he had received an unprecedentedly large number of letters complaining of the deficient power of the light, and requesting formulæ for increasing the sensitiveness of the collodion, of the silver bath, and so on, so as to shorten the exposure. He thinks that, as the exposure can only be shortened up to a certain point, what is required is not more formulæ, but a more careful application of those already known. He calls attention to the fact that, when the chemicals prescribed are not sensitive enough, the cause may often be found in the dirty state of the bath, which is sometimes allowed to contain organic matter that a prudent treatment with permanganate of potash would remove. It should be remarked, however, that if this excellent remedy be not employed with due caution—that is, if it be added in excess—it will do more harm than good. The best way to deal with it is to add but a few drops to the bath at first and shake it up; then, if the rosy colour disappear quickly, add a few drops more, and continue these small additions until the rose colour remains for at least five minutes. Of course it is quite superfluous to say that when it is wished to bring a bath to its highest degree of sensitiveness it should contain very little acid. He then goes on to call attention to the importance of keeping the developer at a proper temperature. The temperature is often allowed to sink as low as 4° or 5° R. If such a developer were warmed to, say, 12° R., it would bring out many more details; and if it should also leave blemishes the addition of a few drops of nitric acid to the silver bath might be useful. Above all, he says, it should be remembered that to take a good, or even passable, photograph in bad weather a powerful objective is absolutely necessary. If that be wanting no chemicals, however pure, can do anything.

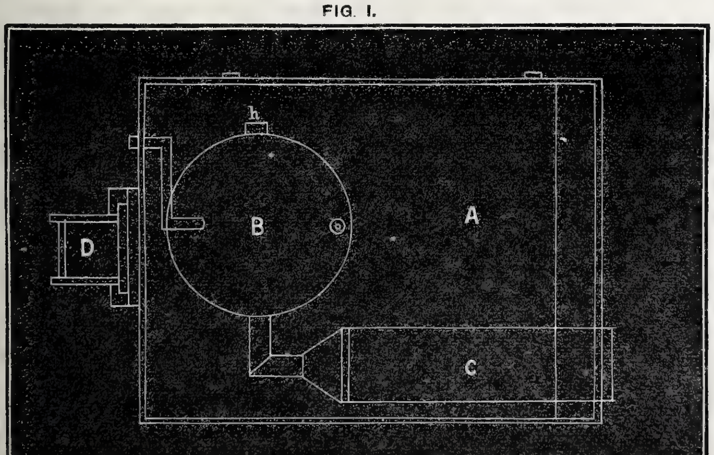
All our readers will be aware that the eclipse of the sun which took place the other day will not be surpassed by any yet to come during the present century. The Royal Society (London) sent out several scientific parties to make observations along the line of total eclipse. These parties were stationed at Camorta, in the Nicobar Islands; at Merqui, British Burmah; and at Chulai Point, Siam. A photographer accompanied each of the parties, the one at Merqui being Dr. Vogel, of Berlin, whose appointment to that post we chronicled a few weeks ago, and whose task was to take photographs of the spectrum of the sun's atmosphere.

## A NEW DRYING-BOX.

[A communication to the Edinburgh Photographic Society]

Drying boxes may be divided into two classes. In the one, moisture-absorbing substances—such as quicklime, chloride of lime, sulphuric acid, &c.—are used as drying agents; in the other, the capacity of the

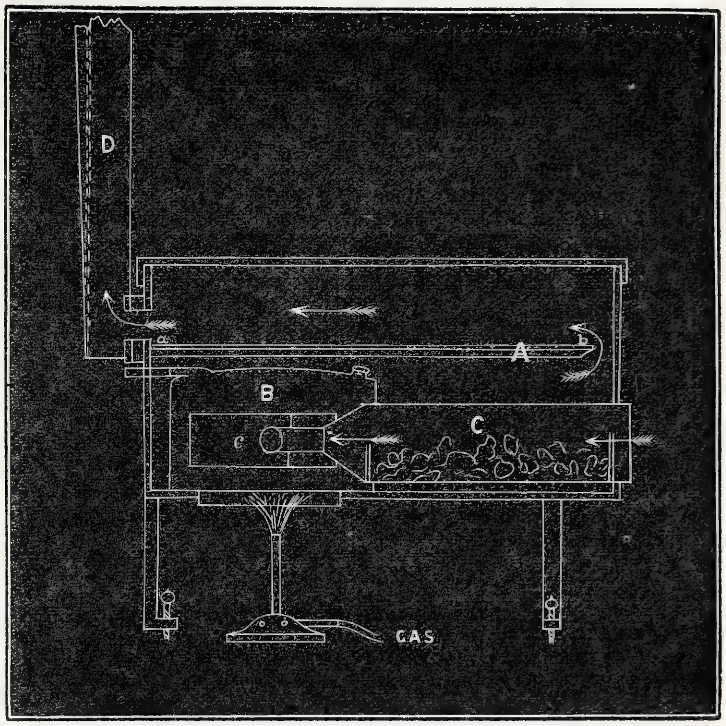
FIG. 1.




air for taking up moisture is increased by raising the temperature. The defects of both make themselves painfully felt in loss of time and uncertainty of action. I have thought that a combination of both modes would be an improvement upon either.

The present apparatus consists of a box A (*figs.* 1 and 2), two feet long, eighteen inches wide, and one foot deep, with a loose lid. One of the long sides is divided about one-third from the top, the parts being hinged together. On a level with the hinges is a glass plate *a b*, extending not quite the length of the box, so as to leave a communication between the upper and lower compartments, into which the interior is thus divided. Heat is applied through a closed boiler B,

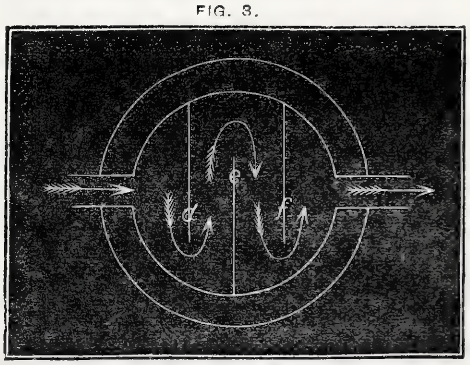
FIG. 2.




ten inches in diameter, and six inches deep; in this is suspended an air vessel *c*, eight inches in diameter, and about two inches in depth, the interior of which is partially divided by three partitions, *d e f*, as seen in *fig.* 3.

One end of the air vessel communicates with a cylinder C, fourteen inches long and four inches in diameter, in which is placed any hygroscopic substance, such as quicklime, and this cylinder projects

FIG. 3.




slightly beyond the end of the box. At the other end of the box, communicating with the upper chamber, is a chimney D. The whole is supported on levelling-screws, for the purpose of adjusting the table *a b*, upon which the plates to be dried are laid. The action of the whole is that the air entering through the cylinder C becomes more or less dried, and in making its way through the air vessel *c* the temperature is raised. On entering the lower chamber at *h* (*fig.* 1) it becomes further heated by contact with the hot surface of the boiler. The air then passes into the upper chamber, and in its progress towards the chimney will dry anything it meets upon the shelf *a b*. The passage of the air may be traced by the arrows in the figures. The apparatus easily raises the temperature inside the box 60° above that of the external air. Should greater heat be required the waste steam may be rendered available by passing it through any length of tin tubing.

E. W. Dallas.

## NOTES FROM THE NORTH.

I wonder what the readers of The British Journal of Photography will think of "penny photographs?" Not much, perhaps, yet I can assure them that they are not to be "sneezed at." If they had seen what I have, recently, they would be constrained to admit that both artistically and commercially they were, in one case at least, a great success. When on a recent visit to the busy manufacturing town of Dundee I "interviewed," amongst others of the photographic fraternity, Mr. John Robertson, who has modestly planted his studio in one of the suburbs. Some time ago, no doubt, he was very much alone; but even in Dundee the march of improvement goes rapidly on, and he is now almost buried in piles of buildings in the shape of mills, warehouses, and their accessories.

Mr. Robertson belongs to the liberal, and therefore successful, school of photographers; and, like the classic knife-grinder, has "no story to tell," or, rather, no secrets to keep. Mr. Robertson gives a warm invitation and hearty welcome to even people of an inquiring turn of mind. About his studio there is nothing particular, except that it is just about as wide as it is long, and is glazed nearly all round, but so supplied with blinds that he can place his sitters in any portion of it that he likes, and get his light from almost any point of the compass. Mr. Robertson's arrangements for his "penny photographs" are very simple. His camera is made for a quarter-plate, and is divided into four compartments; the lens, which is small, and of short focus, is fixed to a revolving plate of brass, with stops that bring it at each turn exactly opposite one of the compartments. In this way four pictures are taken on each plate, and, as he possesses the knack of getting up varied expressions on the faces of his sitters, he thus secures four equally fine but generally different portraits on each plate. From this plate three prints are taken, which are delivered unmounted in exchange for a shilling, which is always paid at the time of sitting.

Now a shilling is not a large sum to receive, nor is it a large sum to pay, and it will be evident that, as there is neither cutting nor mounting, very few assistants are required. As the work is so simple a very large quantity of it can be got through in an ordinary photographic day, and a good round number of shillings may find their way into the coffers of the enterprising photographer. That this has been the case with Mr. Robertson will be evident from the fact that he has just concluded arrangements for the erection of a handsome studio in the centre of the town, where he will doubtless go on flourishing, making money for himself and giving pleasure to hundreds who, but for his penny photographs, would never have had the satisfaction of "seeing themselves as others see them."

I am also anxious that my readers should not think that because the pictures are "cheap" they are of necessity "nasty," because they are far from that; in fact, they are really very fine, and would do credit to the best workers in the land. Mr. Robertson evidently has discovered the fact that it is as easy to make good pictures as bad ones, and that the former pay much better. This could be inferred from the numerous specimens which adorned the walls of the reception room, and is equally shown by the contents of an envelope just to hand, in the shape of a number of prints from negatives of myself and son, for which we were asked to sit. In the case of the latter there is one, representing suffering under a severe attack of toothache, which is really a work of which any man might be proud.

Of course I do not mean to say that Mr. Robertson confines himself to penny pictures. He takes anything that comes in his way, including, according to his printed envelopes, "anything from pin size upwards," and some of his enlargements are very excellent; but, judging from what I saw, I think I am entitled to assume that the popular pennyworth is what brings most "grist to the mill." What is done in Dundee may be accomplished in other places; and I heartily commend the subject to the attention of those of my readers who may have the opportunity of giving it a trial, in fnll confidence that if the venture be properly carried outit will be found to pay.

I would like to say a word or two about the camera recently exhibited before a meeting of the Edinburgh Photographic Society, by Mr. Aird, and which has several times already been noticed in the Journal. I was very much pleased with it at first sight, and now, after a little practical experience of it in the field, find it better than I expected. I had it with me on the occasion of the out-door meeting of the Edinburgh Photographic Society on Thursday last, and also on the two following days. During that time two dozen plates were exposed without a single hitch, and in fact in such a way as to show that such a thing was out of the question. The whole arrangement is so simple, and the absence of a troublesome lot of slides such an advantage, that the camera elicited the utmost admiration from all who were present at the excursion, several expressing their intention of getting one made for themselves.

The fact that the camera is not fettered by any patent restriction will, should it be found not to be an infringement of any existing patent, give an impetus to its introduction, as it may be made and sold by all who choose to take it up; and I feel assured that it only requires a fair trial to become a general favourite.

With Aird's camera and the collodio-bromide emulsion the season of 1875 promises to be an interesting and profitable period for the photographic tourist, and if properly taken advantage of they should give a fresh start to that kind of landscape work. The bugbear of the hotel keeper—the photographer who messed his rooms and stained his carpets—will trouble him no more, and photography in the field will be a pleasure without toil.

If tourists would only turn their attention to the exceedingly simple method of transferring their films that has frequently been published in these columns, they would still further lighten their labours and lessen the risk of loss from accident. All that is necessary is to pour over the finished, but not varnished, negative a solution of gelatine, leave it till the next day, when it can be removed with the greatest ease and certainty. A bottle of solution of gelatine, of suitable strength, to which have been added a few drops of carbolic acid, may be prepared before starting, and in this way the same plates may be used over and over again.

I advise those who are fortunate enough to be able to look foward to a month or six weeks' holiday to prepare or purchase a supply of the emulsion, obtain a bottle of gelatine, and by a little practice get their hands prepared for work. Then, when the time comes, they may start with no greater encumbrance than such a camera as Mr. Aird describes, a walking-stick tripod, a bottle each of emulsion and gelatine, and say a dozen clean plates, and return with a portfolio containing several hundreds of first-rate negatives in the form of flexible films that cannot readily be broken and which may be printed from on either side, and so be really more useful than those on glass in the ordinary way.

"Diogenes," in a recent number of the Journal, tries to take me to task for what he is pleased to call inconsistency in my views regarding supplementary exposure. Will he kindly take the trouble to look at my *Notes* a little more carefully, and he will perhaps see that I nowhere give any indication of a belief in the supposed efficacy of the dodge. What I had before my mind at the time of writing was not the value or uselessness of the practice, but a desire to call attention to the impudence (not to use a harsher term) of trying to sell, for two guineas, information—and that of a most doubtful kind—that had been for months going the round of the photographic publications. My object was not so much to expose the trick as to protect the readers of the Journal from the "sell" of which each purchaser of the packets, if there really were any, must, on opening them, have felt they had been the victim. Surely if "Diogenes" has any right to the name he assumes he will admit that I was writing on the right side of the question.

Photography has a comical side, with which one sometimes comes in contact. Some weeks since I was in a town of thirteen thousand inhabitants in which there was only one photographer, who, one would think, ought to have plenty to do, even during dull days. The result of my visit to him, however, showed that it was otherwise. My call was made on a dull, rainy day about noon. I walked straight up to the saloon, but found no one present. Reception room and dark room were equally unoccupied; and so after stamping about for some minutes, with the view of attracting the attention of any one who might be within hearing, I resolved to retrace my steps. On turning to do so, however, I noticed a stair and bell, and, thinking they might communicate with the private residence of the photographer, I gave the latter a pretty hard pull. After the lapse of several minutes a lady appeared in——well, not in full dress. I inquired for Mr. ——, and was told that on such dull days as this "he did not think it worth his while to get up!" I, perhaps rather impudently, replied that she did not appear to be quite up herself. She, however, did not seem to be hurt at the imputation, but quietly said—"Well, the fact is that nobody cares to be photographed in the rain, and so we just lie still till dinner time!"

John Nicol, Ph.D.

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## ON THE AID WHICH PHOTOGRAPHY HAS RENDERED TO THE FINE ARTS.

[A communication to the Edinburgh Photographic Society.]

When photography was first discovered it was thought that it would eventually rival, if it did not supersede, the fine arts. This it will never do, for several reasons. First, from the limited size; second, the texture or surface of the materials employed; and, third, from the deficiency in colour and impasto.

It may be objected that photography has not yet had time to be thoroughly perfected and developed, as it is really only an invention of the last half-century, while painting, drawing, fresco, modelling, sculpture, architecture and ornament, with all their multifarious applications and combinations, have been known, practised, and nearly all perfected to a very great extent nearly 2,000 years ago, while some of the fine arts have an undoubted antiquity reaching as far back as 3,000 years; for if you search through the marginal references of your Bible you will find that 1,045 years before our Christian era David and Hiram, king of Tyre, were employed in collecting materials for the building and decorating of the Temple, which was commenced by Solomon B.C. 1,012 and completed in seven years—modelling, chasing in metals, embroidery, and carving in wood having all been brought into use for the perfecting of this grand temple.

Shortly after this period, or about 862 B.C., we find that architecture, sculpture in stone, and casting in metals were brought to considerable perfection in Nineveh. Then, at a later date, or 580 B.C., we find Nebuchadnezzar setting up a golden image ninety feet in height (see Daniel iii., 1), and from this period to the second or third century of our era the fine arts appear to have been brought to great perfection in Egypt, Greece, and Italy.

I need not enter into further particulars regarding the relative ages of the fine arts, for we have abundant proofs that they were known, practised, and encouraged many centuries before photography was ever thought of.

Almost every year brings to light new discoveries relating to photography, which prove that, as a science, it is not yet perfected, while as an aid to the fine and industrial arts there is hardly any limit to its applications; and we must all admit that there is not one branch of art or industry to which it has been applied that has not materially benefited by its use.

If we take a glance at some of the multitudinous applications of photography we find that, although artists are greatly indebted to photography for multiplying, cheapening, and preserving truthful records of what has been done in art, still there are limits or bounds to its usefulness, and in a few instances defects which will probably never be overcome; though even in hazarding a statement of this kind it may be safer to say that up to this period the following appear to be the limits of its utility and the defects of photography.

The members of this Society will, perhaps, be startled to hear me talk of the limits and the defects of the science; but there is no question that we are running into a few dangerous and questionable applications. I may instance the attempt to produce life-size portraits upon paper in the belief that these will bear favourable comparison with nature, or with portraits painted in oil with the hand, drawn with chalk, crayons, or water colours, or sculptured in marble. The very nature of the materials with which we work shows us at once one of the serious defects of life-size portraits, for they always suggest the idea of the sitter being pachydermatous (thick and coarse-skinned), or that he or she has lately recovered from a severe attack of smallpox.

Here, then, is one of the limits which ought to be placed upon the practice of photography. Do not attempt a portrait or figure above one-third the size of life; for, independently of the roughness of texture, there is a feebleness in the light and shade, and often a commonplace vulgarity or vacancy of expression, which are exaggerated by being magnified.

But there is another extreme which is equally vicious, degrading, and commonplace in photographic portraiture, and this is the wretched, small, cheap, and nasty *carte de visite*, where the face is about the size of a pea, and where the art of the tailor, dressmaker, bootmaker, or hatter is obtrusively conspicuous, or where one-third of the picture is perhaps occupied by a table or a drawing-room chair, with vulgar spiral or commonplace turnery that detracts from, instead of improving, the picture. *Punch* has some humorous hits at this. I do not condemn all *cartes de visite;* but I think most people now prefer likenesses of their friends of a better description, and are content to have the head of a larger size, if it be truthful. This also admits of more artistic taste; hence, photographic portraiture now finds favour with nearly all classes, and its results are often artistic and highly satisfactory.

There is one peculiarity about some lenses, however, which ought to be noticed, namely, that they frequently dwarf a tall figure. The same defect is also to be traced in landscape photography, especially when applied to gigantic hill scenery, hills being almost invariably dwarfed.

Having pointed out some of the defects of photography we come now to the grandest and most legitimate of its applications. This, however, embraces a wide field; for it means the representation of Nature in all her most tasteful and pleasing and instructive aspects. Now this is the great difficulty with which all photographers have had to contend; for Nature is often very beautiful and pleasing, though many of her beauties are evanescent, or so subtle and transitory that it is only when we attempt to fix them in the camera that we find how miserably we often fail.

But it is necessary to classify the objects of nature before we can lay down any fixed rules for representing them; for this is the very point in which the fine arts have the advantage af photography. Animate or living nature is unquestionably more difficult to represent than inanimate or "still life," as it is called by artists; and it is for this reason that much of the beauty of life—whether in human beings, animals, or birds—depends upon action, movement, or sentiment. Now, when we try to catch or stop this, as we almost invariably do in the camera (for to take a good photograph we must have a certain amount of perfect quiet or repose), we are apt to substitute a pause in the action for the natural grace which generally gives the charm to the action which has pleased us. Hence the cause of many of our failures in catching expression, life, or action. The artist has the advantage of the photographer in this respect—that he can portray action and emotion, and has the power to represent them under sudden, violent, or tender aspects, which in photography are apt to degenerate into attitudes, poses, or gesticulation. Emotions, again, are liable to be either insipid or overdone, and to border upon caricature in photography. Much, however, depends upon the taste, skill, and judgment of the artist or the photographer; and he will be the most likely to succeed who has studied both nature and the fine arts, for fixed rules cannot be laid down for the application of taste. Unfortunately, so rare a gift is it that it is very questionable if it can ever be taught or imparted. Sir Joshua Reynolds's reply to the lady who wished her son to be taught to paint with taste was pithy and laconic—"That, madam, is a matter of brains." Gently tapping his forehead with his forefinger, the President politely bowed the lady and her son out of his studio.

Unfortunately for photography, jealousies, divisions, and hostilities have frequently arisen which, in some instances, have proved very detrimental to its interests, as well as to those of artists and men of science. Some good, however, has resulted from all this; and we must be prepared to admit that, even after half-a-century of experimenting, a few of the early discoveries, and some even of the early processes, will bear comparison with those of modern times.

I must now proceed to particularise, and to describe by photographs which I shall hand round, some of the best uses and applications of the art; for that it is now a branch of the fine arts, and one of their most valuable coadjutors, every true artist must admit. At the same time I hope to be able to satisfy our photographic friends that the fine arts have some advantages, amongst which must be classed a larger, grander, and nobler field for the display of talent—a wider field both of vision and of application—and a delicate refinement both of sentiment and of observation, which allows the artist to abstract from nature beauties of outline, of form, of light and shade, and of colour, which, if not so easy of attainment in photography, have hitherto not been so successfully mastered.

On the other hand, while we claim for the fine arts the higher place in relation to deep thought, delicate refinement, and powerful expression, we must not overlook the fact that photography can also boast of being able to catch delicate fleeting and passing emotions and effects, and to give them a wonderful reality and permanence. Here, however, it is that the difference is apparent. Passing actions, sentiments, or emotions must be well and truthfully represented or they cannot be caught in the camera. In fact, we must have the good actors or we do not get the good pictures; and, besides these, we must have the good manipulator, the skilled chemist, and the eye to detect tasteful arrangements, grouping, *chiaroscuro*, and appropriateness of details to make up a picture. The artist, on the other hand, has the power to select beauties, reject deficiencies, omit redundancies, and to refine and combine all the varied agencies of his art. Some of these the photographer must take as they come, and to his sorrow he finds that all nature is not suited for his art; that very little of it is perfect, and that little is often very difficult to combine harmoniously. But I can better explain my meaning now by coming to particulars and comparisons.

One of the grandest applications of photography has been the reproduction of the frescoes of Michael Angelo, Raphael, Corregio, and the Italian masters. Some of these are much more pleasing now than the frescoes themselves, as the latter have suffered most materially from damp, decay, and restorations; and these defects are not so apparent in the autotype photographs by Adolphe Braun. Most of you are probably familiar with these grand fresco reproductions from the Vatican, the Rispigliosi, and Parma galleries, and Raphael's cartoons at Hampton Court. Next in importance I would be inclined to rank the photographs of the sculptures of antiquity; but in these there are occasional imperfections arising from prominent portions of figures being magnified, while receding parts are diminished. Stains and blotches on the marble also occasionally detract from the beauty of these; but when the photograph is taken from a clean marble statue or a fine plaster cast the result is generally very pleasing.

Bas-reliefs and alto-relievos can be represented with great fidelity, and of these we have numerous and fine examples, one of the grandest being the large series of sculptures and bas-reliefs surrounding the Albert Memorial in London. In this class Michael Angelo also takes a high position, as his sculptures from the tombs of the Medici family in Florence and several of his mural tablets have been very finely photographed. Thorwaldsen's sculptures also take a high position. Next to these I would be inclined to classify the bronze gates of the Baptistry at Florence, after Lorenzo Ghiberti, of which there are several fine photographs—one nearly six feet in height. To the same class belong the bronze gates of Donatello, John of Bologna, and numerous others. As a rule, however, bronzes, especially if new, do not yield such fine pictures as those taken from marble, because of the polished

surface and the bright reflex lights of the metal. Old bronzes, again, are apt to get black, and then they yield heavy, flat pictures. If the bronze, however, be of good quality, and the work of the artist spirited—as some of those by Chantrey, Noble, and Foley—the results in photography are charming.

Another most invaluable application of the art, and perhaps the one in which photography is achieving its greatest reputation, is in architectural subjects; and here the artist is, perhaps, left behind in the competition, for the rapidity with which the picture—its truthfulness, the marvellous delicacy, minuteness, or intricacy of details, and their relative strength, and almost the colour—can be taken baffles the best attempts of man's hand.

This brings me to the serious reflection that photography is mostly God's own work, and that man is in this art really a worker with God; for we are dependent for light and shade, and for its enchanting, but, alas! often too transient, combinations with colour, texture, and surface, upon a higher power than we can control, but one which can often be taken advantage of to preserve passing effects. If the elements be favourable—that is, in artistic phraseology, if the sun be not too bright, the passing clouds not too heavy, or the sky not too murky, dull, or foggy—man can do his part of the work; but how far do his pictures generally fall short of the exquisite beauty of nature as seen in the camera! The photographer may sometimes boast of a successful picture, but what is the average number of his failures? Our best photographers and manipulators must acknowledge that they spoil five or six for every good one taken, and the beginner, perhaps, three times as many. There is a charm, however, in the art that often induces men to go on burning their fingers, wasting their chemicals, and losing their time, their temper, and their money.

Some of our oldest and best photographers have come to acknowledge that it takes a lifetime to arrive at perfection in almost any branch of photography, and that we are not always acting wisely in abandoning some of the early processes. For instance, the old calotype paper process has produced some wonderfully-fine pictures that still rank high. I show you a few of those taken in India and Burmah, and yesterday I saw some very delicate specimens, by a member of this Society, that, similarly to these, have lasted for upwards of twenty years. Another old process—now, unfortunately, almost extinct, but which produced pictures which cannot now be surpassed for delicacy—is the daguerreotype. Of these I show you two very fine specimens; but, as there are so many other branches of the art which ought not to be overlooked, I must take a hurried retrospect of them before concluding.

One of the most useful applications has been the reproduction of *facsimiles* of sketches by artists; and herein the fine arts are daily deriving incalculable benefits. Another application has been the copying of pictures, but in this branch there have been many failures, owing to the colour, texture, or dark and imperfect light and shade of the paintings; as a rule, those in a ligh key photograph best. I think most artists admit now that their pictures pass through a severe ordeal when subjected to photography. Prints, however, whether line engravings, mezzotints, or lithographs, often come out with great delicacy, truth, and vigour. Pen-and-ink sketches, chalk drawings, and pencil studies can often be reproduced with great fidelity, and the most delicate or the boldest lines, or the most tender or powerful effects of light and shade, can be reproduced.

There is another most important application of photography now attracting great and deserved attention, and that is to scientific, pictorial, and illustrative instruction, and in these departments this Society has done good work. The illustrations laid on the table at the last year's and this season's meetings, the diagrams, views of scenery, life, and character exhibited by the oxyhydrogen light, and the fine collections of pictures aiming at high, refined, and pure art—amongst which it might be invidious if I mentioned names, excepting, perhaps, those feeling pictures by the late O. G. Rejlander, shown at the last meeting, and the series of illustrated tours through England, Scotland, America, the overland route to the East, India, and China—all go to prove that photography is now not only a noble art, but a worthy, useful, and beneficent sister to every branch of the fine, the industrial, the decorative, the scientific, and the useful arts, and that, although she may be injuring the prospects of the portrait or miniature painters, still these branches of art flourish; and if they would maintain their superiority it must now be achieved by showing to the public that real art wins the sympathies and affections of the public chiefly by its superiority to photography in abstracting from nature more of the beauties that God has so bountifully scattered around us than the photographer can catch in his camera.

ALEXANDER HUNTER, M.D.

# Meetings of Societies.

## LONDON PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting of this Society was held on Tuesday last, the 13th inst.,—Mr. J. Glaisher, F.R.S., President, in the chair.

Captain Horatio Ross was elected a member.

Mr. Valentine Blanchard then read a paper on *A Method of Enlarging*, of the salient points of which we give a brief summary in one of our leading articles. This process, Mr. Blanchard said, was partially based upon a process introduced by him ten years ago, and which had been sold throughout the country as a secret process. Several fine specimens were handed round among the members in illustration of the process.

The CHAIRMAN spoke in high terms of the specimens as well as of the simplicity of the process. Prints from paper negatives had always possessed a charm for him, and Mr. Blanchard had hit the right nail on the head when he said that the daguerreotype process had died out solely on account of its not possessing reproductive power.

Captain ABNEY had used the process with good effect. He waxed the negatives by placing them in contact with blotting-paper charged with wax, and then passing a hot iron over them.

Mr. BLANCHARD (in reply to a question) said that he used albumenised paper upon which to print the negatives; but he preferred a salted paper containing a very limited proportion of albumen.

Mr. JABEZ HUGHES asked whether the process was applicable for portraits as well as for views, only specimens of the latter having been exhibited.

Mr. BLANCHARD replied that he considered it gave much more beautiful results in portraiture than in landscapes, although his other duties had prevented him from preparing specimens of portraiture.

Mr. HARTLEY suggested solid paraffine as a material likely to be useful in rendering the paper negatives translucent.

Another Member suggested a solution of castor oil in alcohol for the same purpose.

The thanks of the Society were then accorded to Mr. Blanchard by acclamation.

Mr. J. R. Sawyer then read a paper *On Photography in Permanent Pigments*, in which he described the nature and preparation of a flexible support upon which to develope carbon prints. This method he has patented, and the flexible support could be used instead of the rigid metallic and glass supports hitherto employed in the double transfer process. This new support was obtained by coating paper with a five to ten per cent. solution of gelatine rendered insoluble by chrome alum, a coating of lac solution being then applied. We shall give the paper *in extenso* in our next number.

Mr. J. SPILLER said that when it was considered what great progress had been made in carbon printing during the past four or five years, photographers ought to feel grateful to those by whose agency such perfection had been reached.

Mr. BLANCHARD explained that a very high degree of polish could be imparted to a carbon print by means of the American hot burnisher; but it was absolutely necessary that the picture to be operated upon should be made quite hot before being subjected to the burnisher, otherwise it would be spoiled from the damp imbibed by the gelatine. Specimens so treated were handed round for inspection.

Mr. G. HOOPER could not endorse all that had been said in favour of carbon pictures, nor did he think that the future of photography lay in carbon printing. It had been before the world for ten years, and while for large work it was excellent, for small work photographers found it would not answer as well as silver printing. It was complicated, and the impossibility of examining the progress of printing in the printing-frame would always be a drawback. He hoped that photographers would give their attention to the discovery in some other direction of a process that would give them the beauty of silver prints combined with absolute permanence.

The CHAIRMAN said it was quite true that the process had been before the world for more than ten years, but it was equally true that every time it was brought before the notice of the Society it came in an improved form, having made a marked advance in the interval. Such an improvement characterised the process as it was presented to them that evening. He spoke of the great value of the permanence afforded by the carbon printing process, and concluded by conveying the thanks of the meeting to Mr. Sawyer for his communication.

Mr. Sawyer illustrated his paper by carrying out the development and transfer of several carbon prints by the new method, the various operations being successfully performed amid applause.

It was announced that at the following meeting a paper would be read by Colonel Stuart Wortley *On Comparative Rapidity*.

## SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE ordinary monthly meeting of this Society was held in the Society of Arts' Hall, on Thursday, 8th inst.,—Mr. T. Sebastian Davis in the chair.

Messrs. J. Porter and J. B. Hall were elected members.

Mr. F. York read a paper entitled *My Late Experience*. [See page 185.] Several negatives illustrating points in the paper were handed round for examination.

The CHAIRMAN, in complimenting Mr. York upon his paper, and conveying to him the thanks of the Society, referred to an expression made use of concerning leaving amateurs to carry out a certain idea, said that although an amateur might be thoroughly well versed in theory, yet it required the practical application on a considerable scale, which a professional photographer in large practice could only give, to enable it to be valued. With respect to the addition of barium salts to a silver

bath, if there be sulphuric acid present it, as well as carbonates, will be precipitated in the form of the insoluble salt of barytes produced. To produce and maintain the bath in its best state it was advisable to keep it in the dark. He had made a bath which he divided into two portions, one of them being kept in darkness and the other in the light; the former proved, after several months' rest, to be much the better of the two. Concerning an observation made by Mr. York respecting an alleged reduction of the exposure by the addition of methylated alcohol to the developer, he (the Chairman) had used methylated as well as pure alcohol in his developer, but had certainly not observed any shortening of the exposure being necessitated by such addition, that addition having been to the extent of about fifteen minims to the ounce. That, however, was a matter which admitted of very easy proof by subjecting it to the test of experiment.

Mr. BROOKS had directed attention some years ago to the shortening of the exposure by using methylated spirit in the developer. He had found it to be shortened about one part in five. He had added to his collodion with advantage a solution of bromine in alcohol, which was afterwards exposed to the light.

The subject of obtaining methylated spirits of wine of good quality was introduced, and one speaker observed that it could now be obtained with facility.

Mr. WASHAM considered that before they could judge whether methylated spirit produced the effect alleged, it was desirable that they should be made aware of the details connected with the method of preparing the plate.

Mr. BARNES had, long ago, to reject methylated spirit from his developer on account of the trouble its use involved. Since he had given it up and used pure alcohol he had experienced no trouble.

The subject of using a very acid nitrate bath was introduced, but none of the members had had any experience of it—at any rate to the extent of that of Mr. Black, of Boston, whose collodion was, it was said, specially prepared for using with such a bath.

Mr. FOXLEE observed that it seemed to be pretty generally conceded that nitrate of barium acted advantageously when added to a disordered bath. Pinholes, in his opinion, were caused by nitro-bromide rather than by nitro-iodide of silver, seeing that in the olden times before the introduction of a bromide in the collodion pinholes were unknown.

Mr. SIMPSON thought that the facts were different from what Mr. Foxlee apprehended. About twenty-two years ago, when the proposal was just made to saturate the bath with iodide of silver—a time long before the introduction of bromine in collodion—he had saturated a bath in that manner, and the very first plate was completely riddled with pinholes.

Mr. WARNERKE thought that pinholes were caused by fulminate of silver rather than by the iodide or bromide.

After some further conversation the subject was dropped.

Mr. KENNETT then demonstrated the method adopted by him of developing plates prepared by his gelatino-pellicle. He exposed under a negative three plates to the gas for a very brief portion of time and developed them. The transparencies thus made were inspected with much interest.

After a vote of thanks to Mr. Kennett the proceedings terminated.

## MANCHESTER PHOTOGRAPHIC SOCIETY.

THE ordinary monthly meeting was held at the Memorial Hall, on Thursday evening, the 8th inst.,—Mr. W. T. Mabley, President, in the chair.

The minutes were read and passed, and Mr. R. P. Gregson, of Blackburn, was elected a member of the Society.

Mr. Frankland presented the Society with an oxyhydrogen lantern, made by Messrs. Pumphrey Brothers, of Birmingham.

The PRESIDENT said the members could see before them the handsome present of Mr. Frankland, and would, no doubt, acknowledge it in a suitable manner.

Mr. Frankland received a hearty cheer for his liberality.

As there was no special business before the meeting the proceedings terminated at an early hour.

## EDINBURGH PHOTOGRAPHIC SOCIETY.

AN ordinary meeting of this Society was held at 5, St. Andrew-square, on the evening of Wednesday, the 7th inst.,—Dr. Thomson, President, in the chair.

The minutes of previous meetings were read and approved, and the following gentlemen admitted ordinary members:—R. Gravatt, Robert M. Alster, William Barlas, William Nicol, Thomas Symington, W. D. Young, Henry Welsh, and Andrew Slater.

Mr. Black, of 2, George-square, then laid on the table, for the inspection of the members, several folios of photographs which his brother had recently brought to Edinburgh. They were principally copies of the works of the ancient masters, including Titiens, Paul Veronese, Guido, Michael Angelo, &c., &c., from the best museums, galleries, and churches in Italy, and were intended to give to those who cannot themselves visit these interesting collections an opportunity of seeing and studying those fine works. The collection was very much admired, and great surprise was expressed at the admirable way in which the difficulties of such reproductions had been overcome.

The following question from the box was then read—"Can the relative merits of lenses by different makers be discussed at the Society's meetings?"

Mr. W. NEILSON said that he thought the only answer possible was—"No." As a Society it would not be right to pass any verdict on any question between rival makers. Such a discussion ought not to take place, unless at the request of those concerned. If a manufacturer were to send an article to a meeting of the Society, with a request that it might be tested and reported on by a committee, he could understand that coming within the province of the Society; but to the question, as put, he proposed that "No" be given for an answer—a motion which was carried *nem. con.*

Mr. E. W. Dallas then exhibited and described a new drying-box [see page 187] for dry plates, especially gelatine films, where it is desirable to be able to secure a well-regulated supply of warm, dry air. The arrangement was much commended; and as Mr. Dallas coated and dried a gelatine plate in the presence of the members, there could be no doubt that it will be found to be all that its inventor claims for it.

Mr. W. H. Davies then read *Some Notes on the Use of Permanganate of Potash as a Toning and Intensifying Agent* [see page 184], and exhibited a number of specimens by way of illustration of his opinions.

Dr. HUNTER thought there was sometimes a difficulty in attributing fading to its true cause, as he had often found it to come on when no extraordinary chemical had been used, and in cases where retained hypo. was out of the question. He believed, however, that in many cases it was caused by impurities in the washing water. He had found that prints washed with pure water from the hills in India stood much better than those that had been washed with the sometimes impure water of the plains; and he thought it just possible that fact might apply to the transparencies which had been toned with the permanganate salt.

Mr. TURNBULL had frequently used the permanganate in toning and intensifying, but had not paid much attention to its keeping qualities. He thought, however, that as there was a doubt in the matter, and as there were plenty of equally useful chemicals, it might with advantage be laid aside.

Mr. A. S. Mackay wished to call attention to some of the enlargements exhibited by Mr. Dallas, especially to two from the same negative—the one touched, the other untouched. The untouched head possessed a character and breadth which had been altogether destroyed by the touching to which the other had been subjected. The touching of such heads should only be attempted by a really skilled draughtsman. He did not, of course, mean to say that retouching in some degree should never be attempted, but simply to ask the members to look at the pictures on the table, satisfy themselves as to the amount of character sacrificed, and, if they did retouch, to see that is was skilfully done.

Dr. HUNTER then read a paper *On the Aid which Photography has Rendered to the Fine Arts* [see page 188], illustrating it by a large collection of prints, &c. The paper was listened to with much attention, and elicited frequent expressions of approbation.

The CHAIRMAN said the meeting had been peculiarly fortunate in having so much interesting matter before it. Dr. Hunter had furnished much material for interesting discussion; but the late hour to which the business had extended would unfortunately prevent it taking place. He then laid on the table some prints for the Society's album, sent by Marshall Wane, through Mr. Bashford, of statuary by a native of the Isle of Man, Mr. Swinnerton—at one time a student in Edinburgh, but at present resident in Rome. The group was his latest production, and showed evidence of great ability. He (the President) proposed that the thanks of the meeting be given to Messrs. Black, Dallas, Davies, Dr. Hunter, and Mr. Wane.

The motion was unanimously carried.

The CHAIRMAN then read a communication from Mr. Baden Pritchard in reference to a proposal to raise a fund for the benefit of Mrs. Rejlander. He wished he had sufficient eloquence to plead the cause of the widow as it deserved. The Society had recently sent her a letter of sympathy; it now had an opportunity of putting such sympathy into practical effect. What was especially wanted was the handing over to Mrs. Rejlander the whole of the negatives left by her lamented husband, and thereby putting her into a position of honourable independence; and he had no doubt the Society, or rather each member, would consider it a privilege to do his part in the good work.

Mr. W. H. DAVIES suggested that the subject be placed in the billet calling the next meeting, and that Mr. Pringle be requested to act as secretary to receive subscriptions.

The meeting was then adjourned.

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The first outdoor meeting of this Society for the season was held on Thursday, the 9th instant. The members assembled at the west-end station at ten o'clock, and went by the Caledonian Railway to Colinton, where the cameras were unpacked and set up, and the work of the day began. Curiously enough, all the plates on the ground were the favourite "beer and albumen."

The first exposures were got at the old snuff mill—almost the last of its kind in Scotland; and as it and its vicinity afforded excellent food for the camera nine plates were exposed. The party then, on the invitation of Mr. Fleeming, visited the interior of the mill; but as the process of grinding the tobacco was in full operation they soon sought the open air, with the exception of some half-dozen, who, in spite of the inconvenience, remained long enough to have the whole process of fermentation, grinding, mixing, and sifting explained to them.

From the mill they proceeded up the waterside, by Juniper Green, to Currie, where the work of the day was brought to a close on some of the quaint old cottages that lie on the river's bank. An adjournment was then made to the Riccarton Arms, in which a pleasant hour was spent; after which the party took the train for Edinburgh, all highly pleased with the excursion, and hoping that it would prove a type of many such pleasant days to follow, during the forthcoming season.

# Correspondence.

## FUNCTION OF PLANO-CONCAVE LENSES.—CONTINUATING ACTION OF LIGHT.

*To the* Editors.

Gentlemen,—As there appears to be some doubt as to the efficacy of the plano-concave glass front as applied to the dark slide of the camera, and explained by Professor Piazzi Smyth in your Almanac for the year 1874, I write asking the Professor's opinion on the subject, and whether he has had occasion to modify it since writing the communication in question.

I find that there is some doubt as to the action of such a plano-concave glass on the rays of light passing through the lens.

One of the objections brought against the plan is that the rays would be *bent outwards*—not all carried on to one and the same plane. If Professor Piazzi Smyth would favour us with an explanation of the real action of the "plano-concave," and kindly prove that the above is not the case, he would be doing me, at least, a great favour, as for some time I have been thinking of having a camera made after the instructions given by him in the Almanac.

It may be worth while to remind those interested in the "continuating action of light" question—especially those that hold that this action only takes place when the tissue is dry—that one of the late M. Marion's processes (mariotype by contact), published shortly before his death, *depended* on the presence of *moisture* in the bichromatised films *to bring about* this continuating action—at least this action would *not have gone on without it.*—I am, yours, &c.,

*Cotheridge Court, near Worcester,* Herbert B. Berkeley.
*April* 13, 1875.

## TOUGHENED LENSES.

*To the* Editors.

Gentlemen,—As it is probable M. de la Bastie's grand discovery of a method of toughening glass without destroying its transparency contributes also to a great increase of density, it has occurred to me to throw out a hint to our friends, the opticians, to examine the matter with a view to practical application in their line.

It would be interesting, first of all, to know the indices of refraction of toughened crown and flint glass. This could soon be determined. The non-liability to fracture in a lens, though very important, is of little value compared with improved optical qualities. I should say very few valuable lenses get broken; still it will be an advantage to have a lens not easily injured.—I am, yours, &c., Duncan C. Dallas.

362, *Gray's Inn-road, London,*
*April* 10, 1875.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

W. S. (Margate).—In our next.

B. C. D.—The engraving is still copyright.

C. Rawlinson.—State more definitely what you want. We cannot understand you.

B. O'C.—Mr. Newman, of Soho-square, publishes a manual which will answer your purpose.

H. W.—Received ten shillings for the Rejlander fund. We shall be delighted to receive the reminiscences.

R. M. L.—The salt enclosed is not nitrate of silver at all, but nitrate of potash. No wonder you could not succeed.

Cotton (Wakefield).—Messrs. W. W. Rouch and Co. supply what you require. We do not know of any other.

John.—Remove the flocculent precipitate by filtration, and the clear liquid will be found to answer quite as well as before.

A. J. Simpson (Casino, Richmond River, New South Wales).—Money-order duly received, and the amount passed to your credit.

G. S. R.—An error lies at the foundation of all your calculations. The optical centre is not where you imagine it to be, but is on the outside of the convex surface.

J. Nesbit.—We are submitting your letter to a well-known maker of the instrument, in order to ascertain what he has got to say on the matter.

Bella.—Apply retouching varnish to the negative, and you will then be able to put in all that is required by means of a blacklead pencil.

J. A. F.—Wash the glass very clean, brush over it some gum water, and, having wet the print, place it in contact with the glass and allow it to dry.

Simplex.—Apply a little putty-powder and water to the end of the finger, and a few smart rubs upon the glass with the finger thus charged will remove all traces of oxidation.

S. P. Q. R.—We regret that we do not know of any one at present requiring your services, although there may be many such. Advertising is the best way of ascertaining.

Greenhorn.—Common washing soda is meant. Had you not been a "greenhorn" you would have seen more than once an explanation of the American term by which you have been troubled.

B. Jenkin.—Not only shall we have no objection to your calling to see our camera, but it will give us pleasure to afford you an opportunity of examining it. The three flanges are screwed on one front.

J. Wright.—Do not purchase the plot of ground until you have ascertained that none of the neighbours will raise objections to the erection of the proposed studio. It will be safer for you to consult a solicitor.

R. Wilton.—Thanks for the description of your substitute for the dark room. We shall be glad to examine it when you have an opportunity of calling. It appears to be similar to one we have already described.

Beta.—There is no manual in existence of the kind you desire. Mr. M. Carey Lea's comes nearest to your requirements. We need scarcely observe that you will derive much benefit in your search by looking through some of our back volumes.

Canvas.—Why not use an emulsion process? It is simpler, cheaper, and less messy. We have seen some fine enlargements obtained by such a process. Unless supplied with details of your method of working we are unable to offer any hints that would be of much use.

W. Shirrell.—Try the effect of using a twenty-five-grain silver bath, together with the addition of a little more bromide to the collodion. Immerse the plates much longer than usual. We have not yet had time to examine the samples of cotton enclosed.

Amateur (Queensland).—1. To embrace the four hundred yards from the same standpoint you must use a lens having a shorter focus.—2. No matter what lens is employed the distance will always be better lighted than the foreground; but it is possible to equalise this in the negative by a shade in front. We do not think it desirable that this expedient should be much resorted to—if at all only in exceptional cases.

Alexis.—We advise you to clean the opal glass thoroughly with nitro-muriatic acid, then wash, and give a coating of diluted albumen. It appears to us that there is an unnecessary proportion of citric acid in your developer, especially if you employ an old or well-matured collodion. Wash carefully before toning. If you still fail, furnish us with particulars of manipulation.

J. S. T.—The best way to liquefy albumen, especially in small quantities, is by means of a perforated cylinder with a solid wooden piston, such as we described in this Journal nearly two years back. Dried albumen answers well for the purposes referred to. We have not yet seen any specimens of M. Despaquis' work. See the announcement at the top of his advertisement in the present number.

Nitrate of Barytes.—Mr. York, in a note on this subject, says:—"I did not mention at the meetiug of the South London Photographic Society the quantity of nitrate of barytes I used, concluding I should be asked that question. I found that five grains to the ounce answered for the old bath I experimented with. I tried smaller quantities, but found, after filtering, the addition of more nitrate caused a further precipitate, which ceased after five grains had been added."

Poking Fun.—The photographic business improves because new features are constantly introduced.—*Sun.*

Society of Arts (Chemical Section).—This (Friday) evening, April 16, a paper, *On the Recent Advances in Photographic Science,* will be read by J. Spiller, Esq., Vice-President of the Photographic Society. The chair will be taken at eight o'clock by Warren De la Rue, Esq., D.C.L., F.R.S.

## METEOROLOGICAL REPORT,

*For the Week ending April* 14, 1875.

Observations taken at 406, Strand, by J. H. Steward, Optician.

These Observations are Taken at 8.30 a.m.

| April. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 8 | 29·59 | W | 40 | 42 | 55 | 38 | Cloudy |
| 9 | 29·88 | NE | 40 | 41 | 45 | 40 | Dull |
| 10 | 30·14 | NE | 42 | 43 | 48 | 40 | Raining |
| 12 | 30·20 | NE | 40 | 41 | 47 | 39 | Dull |
| 13 | 30·24 | E | 38 | 42 | 51 | 39 | Cloudy |
| 14 | 30·33 | SE | 37 | 38 | — | 36 | Foggy |

CONTENTS.

THE BRITISH

# JOURNAL OF PHOTOGRAPHY.

No. 781. Vol. XXII.—APRIL 23, 1875.

## THE CHLORIODO-BROMIDE WASHED EMULSION.

It is our intention this week to complete the account of our experiments with Mr. M. Carey Lea's recently-published emulsion process, our remarks upon this occasion having reference to his last method —the application of an organifier to a mass of partially-desiccated emulsion containing free silver nitrate. The advantages claimed for this method by our friend Mr. Lea are greatly-increased rapidity and superior intensifying power, in addition to which the introduction of silver iodide into the emulsion obviates the necessity of the unpleasant operation of colouring the back of the plate to prevent blurring—advantages which, we think, may be said to constitute it the perfection of the washed emulsion processes.

The importance of such a result as the production of an emulsion which is in itself complete, requiring no washing, no preservative, and not even the trouble of artificial drying, cannot be too highly estimated; and when, in addition to these advantages, the emulsion may be kept indefinitely, is ready for use at a moment's notice, and, above all, is as sensitive as the ordinary wet process, we think that the consummation of photographic requirements has been attained. It is remarkable how rapidly the various steps in this result have followed one another, and, while awarding the honour to Mr. M. Carey Lea of having placed the "corner-stone" to the structure, we must not forget the equally important work of those who laid the foundation and built up the walls. After all, who can tell what further improvements may not even yet be made?

In following out Mr. Lea's instructions we used the second formula for collodion given by him at page 173. Twenty ounces of this collodion were sensitised with thirty grains of silver nitrate to each ounce. We made use of this quantity principally because we were desirous of trying several different organifiers under identical conditions as regards the emulsion, and this object is not certain of attainment if small quantities are sensitised at different times. We also wished to test the facility of preparation in large quantities; for, be it remembered, we are writing mainly for amateurs, and few of those, we imagine, will require to make up more than that quantity at once. The maximum quantity of silver nitrate was used in order that we might obtain the full advantage in sensitiveness; but we think that, for general purposes, two or three grains less in each ounce will be found more manageable both in making the emulsion and in its subsequent use. We must here state that, as we had anticipated, the iodide gave much greater trouble in emulsifying than is the case with smaller quantities; and we think that more of it was left to be filtered out before drying, otherwise we have nothing to add to what we said last week upon the first part of the process.

The emulsion, after filtering, was poured out into flat dishes; and in order that the dried mass might be as nearly uniform in thickness as possible, and equally accessible to aqueous solutions, a measured quantity was poured into each. When "set" with tolerable firmness the different organifiers were poured on, and the sheet of "pellicle" cut up with an ivory paper-blade and detached from the bottom of the dishes. We think the length of time mentioned by Mr. Lea during which the film is to remain subject to the action of the organifier is too short to allow the latter to penetrate far into the repellent mass of half-dried emulsion; in our experiments the action was allowed to continue for thirty minutes instead of fifteen. Six different organifiers were used as follows:—

1. Mr. Lea's: gum, sugar, albumen, tannin, and gallic acid.
2. Coffee, gallic acid, and sugar.
3. Gallic acid, gum, and sugar.
4. Tannin, gallic acid, and grape sugar.
5. Plain albumen.
6. Beer and albumen.

Glacial acetic acid, in the proportion of one drachm to four ounces, was added to each, in spite of which several of them visibly discoloured the pellicle, either while soaking or during the subsequent washing. The washing occupied between three and four hours, many changes of water being employed, until all traces of silver had quite disappeared. The pellicle was then pressed and dried by gentle heat. When dried various colours were exhibited by the different batches, ranging from deep brown-black to pale grey; but it was only on the surface, as could be seen by breaking one of the small pieces, when the fracture showed the usual tint of a sensitive film. The dried product was redissolved in the proportion of twenty-four grains to the ounce of solvents, equal parts of ether at ·730 and absolute alcohol being used; but the resulting emulsions required thinning considerably before use. The solution occupied some hours, some of the samples emulsifying more readily than others. No. 5 proved the least soluble.

At the end of twenty-four hours they were ready for use, and duplicate plates were prepared from each sample. These were exposed in rapid succession on a fine clear day in sunshine, a doublet lens of eight inches focus and three-eighths inch stop being used. A wet plate was found to require ten seconds, so the two plates from each emulsion received ten and twenty seconds respectively, with the following results:—

No. 1. The shorter exposure appeared to be sufficient, though the details were rather long in coming up and scarcely comparing with the wet negative. The twenty seconds' exposure left nothing to desire in point of exposure. There was a little difficulty in keeping the shadows clear during the intensification, and a tendency to flatness.

No. 2. Not quite so sensitive in the feebly-lighted parts, but gave better-looking negatives, the longer-exposed one being equal in every respect but exposure to the wet plate.

No. 3. Unsatisfactory; about equal in sensitiveness to No. 1, but weak, flat, and dirty in the extreme.

No. 4. Very similar to No. 2, both as regards rapidity and ease in development. The best coloured negatives of the batch.

No. 5. The plain albumen preservative was an experiment of our own to determine to what extent the albumen in the formula No. 1 really enters into the pellicle. We think that, as we have been able to make the mixture, the albumen is not presented in an available form, and does not enter into combination with the silver contained in the emulsion. In this idea it appears to us we are borne out by this experiment; for, upon redissolving the pellicle, it takes very much longer to form an emulsion than that prepared with other organifiers, and makes a much thinner emulsion, owing to a large proportion of it refusing to emulsify at all, remaining after more than a week as a hard, lumpy mass at the bottom of the bottle. It seems to us that the albumen—which, in this case, does undoubtedly combine with the silver—forms a compound which is insoluble in ether and alcohol, and once dried is incapable of re-emulsification. The

sensitiveness of this sample was equal to No. 1, and, though a little difficulty was experienced in obtaining density, the plates developed very clean and free from veil.

No. 6. The beer and albumen preservative being an old favourite of ours we have tried it in connection with this process, and have no cause to regret it. The sensitiveness is about equal to Nos. 2 and 3; the plates develope very free from fog, are easy of intensification, and of beautiful colour and great delicacy. In making this preservative it is needful to test the beer used for chloride of sodium, as few samples are found to be free from salt. If found to be present, it must be precipitated by means of a few drops of solution of nitrate of silver, or the sensitiveness of the plates will be impaired.

It will thus be seen that the result of our trials is all in favour of the new emulsion as against any emulsions we have tried previously. In saying this we speak of its general qualities. We have met with emulsions which would work with greater rapidity, but with which we could not produce negatives equal in quality to those given by this method. That dry collodion in any form will ever replace the wet process for extremely rapid work—that is, rapidity combined with quality of result—we do not at this present time believe; but for the general work of an amateur, whose object is to produce the best possible result with the expenditure of a minimum of time, trouble, and money, we think that this or some analogous process will eventually bear the palm.

We can with confidence recommend our readers to give the process a trial, feeling sure that any progress made in the direction of simplicity, combined with certainty and good working properties, cannot fail to extend the field of our art-science, and induce those to venture into it who have hitherto been unwilling to face the difficulties surrounding photographic operations.

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Since writing the foregoing we have received a further communication from Mr. Lea (to be found in another column) in which he makes mention of two or three slight modifications in the original formulæ published by him, which are, of course, not included in our experiments. The bath emulsion process we have not yet tried, and as Mr. Lea himself gives the preference to the one more fully described we need not make further allusion to it at the present time.

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## ON LENSES, DIAPHRAGMS, AND RAPIDITY.

Year after year we find a certain class of questions recurring with periodic regularity. The present year, judging from the number of questions we have already received with respect to one of these subjects, will certainly prove no exception to the rule. The query to which we are about to attempt a reply in the present article has reference to the comparative rapidity of lenses.

We are continually being requested to give advice respecting the selection of lenses—especially as between the productions of various makers—and to state which of the numerous lenses introduced to the photographic public are most likely to satisfy the condition required in particular cases. To such questions we have only one answer—we make a point of never recommending the lenses of one maker in preference to those of another; although, when lenses are sent to us for examination or for notice in our columns, we never hesitate in giving expression in unmistakable terms to the opinion we have arrived at after personal and practical experience.

Selecting two or more lenses from the catalogues of rival makers, and in some instances of the same maker, the question is frequently put—"Which lens will prove to be the most rapid?" We have repeatedly said that the question of relative rapidity is really one of dimensions as compared with focus. What we now desire to impress upon such of our readers as may not be aware of the fact is this—that by the knowledge of a few simple principles, which we shall presently explain, the photographer may all day long use in succession a variety of lenses, passing at once from the longest to the shortest focus and using either a large or a small stop, and yet during the whole day not spoil a single plate from either over- or under-exposure.

The whole secret lies in the knowledge which may and ought to be acquired by every person possessing a lens, namely, the relation borne by each diaphragm to the focus of the lens. Armed with this information all the rest is easy. We give an example of the practical application of such knowledge. We were, a few mornings ago, taking a view, with a lens of five inches focus and a very small stop, under such circumstances that we knew ninety seconds to be the correct exposure; but in order to obtain a second view of a portion only of the subject that had just been taken, and which had to be delineated on a much larger scale, we found it necessary to use a lens of twenty-two inches' focus. Now, as on every stop belonging to each lens in our possession the relation of the aperture in the stop to the focus of the lens is marked or stamped, the determination of the correct time required with the larger lens was thus reduced to a matter of certainty. The figures "48" were stamped upon the stop used with the smaller lens, the meaning of these figures being that the focus of the lens was this number of times greater than the diameter of the aperture in the diaphragm. To ascertain the proper time of exposure for the lens of longer focus it was evidently only necessary that a diaphragm be used bearing the figures "48," in which case the exposure required would be similar to that given with the smaller lens, or, otherwise, a lower figure, indicating that the aperture was so much larger in proportion to the focus than the other, in which case the time of the exposure would have to be reduced in a corresponding degree. Let it, therefore, be clearly understood that any lens—no matter what may be its construction, focus, or dimensions—will, when used with a stop bearing a number similar to that just mentioned, work quite as quickly as any other lens used with *its* stop of a similar number, no matter whether the actual aperture in one stop be scarcely larger than a pinhole, while that in the other be two or three inches.

Although we have said that all lenses, when the ratios are thus fixed, will work with an equal degree of rapidity, let it be understood that they will only do so if they are constructed of equally good glass and possess an equally fair degree of surface polish. Some years since—before the making of optical flint glass was so well understood as it is at present—many lenses, otherwise very good, were somewhat slow from the yellow, or pinkish-yellow, colour of the flint glass used in their construction. It is obvious that this is an element which must disturb the comparison of one lens with another; but as all, or at least very nearly all, lenses are now made of colourless glass, and as every maker who has the least regard to his reputation polishes the surfaces of the glasses properly, all considerations arising from this source of error may now be overlooked.

We would strongly recommend photographers to have every diaphragm stamped—not, as hitherto, with the senseless, unmeaning Nos. 1, 2, 3, and so forth, which, for the purpose of enabling one to judge of comparative rapidities and exposures, convey no meaning whatever, but with such figures as intimate plainly the value of the aperture. For example: if all the portrait lenses of an establishment have stamped upon them $\frac{f}{4}$, $\frac{f}{6}$, $\frac{f}{10}$, &c., by which is clearly understood by the operator, in the case of the first of these, that the aperture is one-fourth of the focus, one-sixth and one-tenth in the case of the others; and if, after taking *cartes* for some time with an $\frac{f}{10}$ stop in twenty seconds, he be suddenly called upon to take a cabinet or whole-plate picture by means of a larger lens, he knows that if he employ the $\frac{f}{10}$ stop of that larger lens the exposure required for the large picture will not exceed that previously given for the smaller one. That is to say, the exposure *theoretically* is the same, although in practice, owing to the greater thickness of the glass and other considerations, it will be found that a little longer exposure must be given. Or, seeing that lenses of long focus require a stop proportionally smaller than those of shorter ones, he can easily estimate the increase of exposure required; for, as the exposure increases according to the square of the diminution of the aperture, if $\frac{f}{10}$, which requires an exposure of twenty seconds, be found too large an aperture, and the operator be necessitated to use a stop represented by $\frac{f}{20}$, then he will have to give an exposure of four times the duration required previously, or one minute and ten seconds. With an $\frac{f}{15}$ stop the exposure would be doubled, or equal to forty seconds. Comparative exposures could thus be easily ascertained, and the relative proportion of time required for one picture with any kind of stop or with any kind of lens deduced with

practical accuracy from a knowledge previously acquired of the proper time with any other lens. Although this is the rule, it is well to bear in mind the general truth that, even when the ratios of aperture are equal, lenses of short focus work more energetically than longer ones. Allowance should, in consequence, be made for this.

To ascertain the real relation existing between one stop of a certain lens and another of the same set it is only necessary to square the diameters of the apertures; the quotient expresses that relation. To cite the example given above, or, rather, to prove its accuracy, let us once more compare $\frac{f}{10}$ with $\frac{f}{20}$ as respects rapidity. As the square of the former is 100, and that of the latter 400, the exposure required for the former is as one to four of the latter.

In estimating the rapidity of different lenses all that is required is to divide the focus of the lens by the aperture in the stop, and then square the remainder. If desirable the result could be marked on one side of the stop, and thus, without any computation whatever, the value of the stop in respect of comparative rapidity could be seen at a glance.

## MR. SPILLER AT THE SOCIETY OF ARTS.

It was impossible to mistake the meaning of the expression on the faces of the photographers present at the meeting of the Society of Arts, on Friday evening, the 16th instant, who had come to listen to what was advertised as a lecture on Recent *Advances in Photographic Science* by the Vice-President of the London Photographic Society; for that expression clearly indicated what several who were present have since stated—that had Mr. Spiller's lecture, with the exception of a few sentences, been written six or seven years ago the title would have been much more appropriate than it was as applied to the present period. For our own part we cannot help thinking that a capital opportunity was thus missed for conveying to the members of the Society of Arts correct information as to the recent advances made in connection with our art-science. Loyalty to the journal published by his own society probably kept its Vice-President from seeking information concerning the modern progress of photography from other pages than those of that once useful publication; but, on the assumption that among the audience might be some who were not quite behind the times, it would have been well had such devoted attachment been kept for the time in abeyance. Had the lecture been prepared for some homely audience at a mechanics' institute in the most northerly of the Orkney Islands it would have been less open to criticism; but we do think that, prepared as it was for a meeting of the Society of Arts—and at which Mr. Warren De la Rue was to preside—the members of which are, as a whole, tolerably conversant with the more recent outcome of photographic art and science, a grave misapprehension of the importance of his position existed on the part of the lecturer.

But to descend to particulars. The formula of Colonel Wortley for nitrate of uranium in an emulsion is not, as was stated, "even now on its trial;" for it was published several years since, and has long passed the tentative stage—depending on it being at least one branch of manufacturing industry. Again: the collodio-bromide process of Sayce and Bolton was *not* founded upon an earlier observation of Mr. Simpson when experimenting with collodio-chloride; and if Mr. Spiller had considered it worth his while to have read up the early history of this process he certainly would not have made such an assertion. For "*dry* plates" possessing permanent sensitiveness it would have given us pleasure to be able to sustain Mr. Spiller's claim to having, in conjunction with Mr. Crookes, been himself the leader of the way; but, as a simple matter of fact, the process of Messrs. Spiller and Crookes was so far from being a *dry* process that special attention was directed at the time to the fact that these gentlemen had selected *deliquescent* salts which would prevent the drying of the film. If Mr. Spiller modifies his claim, and assume to have been the first to suggest a *moist* process, we have no objection to entertain it; but not otherwise. The collodio-albumen process arose, not from the nitrate of magnesia preservative applied by Messrs. Spiller and Crookes, but from the negative albumen process which had been well known and extensively practised several years previously, and which, in truth, had formed the basis of descriptions in manuals as well as in the Report of the Great Exhibition of 1851, several large and excellent pictures by Messrs. Ross and Thomson, of Edinburgh, having been there exhibited. Dry collodion, pure and simple, or a means of using collodion in a dry state, was published, prior to the advent of the nitrate of magnesium process of Messrs. Spiller and Crookes, by M. Gaudin, who, in *La Lumière* of April 22nd, 1854, described how a sensitised collodion plate might, by having the free nitrate of silver removed by washing, be made to retain its sensitiveness for a considerable period, either in its wet state or after it had become dry. Reference to this was made in the *Journal of the Photographic Society* in May of the same year.

Further: the "latest development" of the dry-plate system is not the beer and albumen process, as Mr. Spiller states it to be, inasmuch as that process has been before the public since July 26th, 1867, at which date it was first published* in The British Journal of Photography, and since which time many other dry processes have been brought forward as claimants for public favour.

Again: why place Mr. Jabez Hughes in a false position by connecting his name with the production of transfer collodion pictures—that is, pictures developed as transparencies on glass by the collodion process and then transferred to paper or opal glass? Mr. Hughes certainly has produced some exquisite pictures by this process, some of which were to be found in the exhibition of last year; but when processes are introduced in implied paternal connection with names it would be well that an amiable partiality in favour of one's friends should give way to historical accuracy. We supply the information here imperatively required by stating that the invention of the process is properly due to M. Moitessier, who introduced it as far back as 1857, and that in 1860 it was taken up by Mr. Prætorius, who worked it most extensively in the studio of M. Disderi, where many thousands of pictures were obtained by means of the process.

Passing over many other statements upon which, were we disposed to be hypercritical, we might have founded objections, we may inquire if it be not now becoming a little monotonous to hear at nearly every lecture on photography doleful jeremiads on the instability of silver prints and the immense superiority of carbon, usually winding up by a "demonstration" of the latter process?

In speaking of the processes which depend upon the use of printers' ink, Mr. Spiller might, we think, with good effect have given to Asser and Shadbolt a small slice of the share of such credit as he considers due to the first introducers of the "papyrotype" process; for that the process was published by those gentlemen in this Journal *many* years back stands on record. *Scripta litera manet.* As was shown by a speaker at the close of the lecture, the Dallastype process, which was ranked among the photolithographic processes, is in reality a *typographic* process, Mr. Dallas laying special stress upon the fact that it forms an efficient substitute for wood engravings to be printed in connection with type. The process of Mr. Hancock is of a similar character. Before concluding, we may refer to a statement made respecting Mr. Thomson's large work on China having been illustrated by carbon prints. As we explained fully at the time we reviewed these works, the illustrations were all printed in printing-ink by the *lichtdruck*, or mechanical, process.

We regret to have been compelled to speak in terms otherwise than of unqualified approval of Mr. Spiller's lecture; but we have given but a faint enunciation of opinions which have been expressed with reference to the discourse. As photography has undoubtedly made great advances since Mr. Davenport read his able and exhaustive paper before the same Society on processes relating to reproduction by the printing-press—and of the existence of which *résumé* Mr. Spiller should have been aware—we cannot avoid feeling a measure of regret that he did not avail himself of the opportunity of bringing the "*recent* advances" made in photographic science before the notice of such an influential Society.

* By Mr. W. H. Davies, of Edinburgh.—Eds.

## NEW EMULSION PROCESSES.

Two or three weeks since I described two new processes in this Journal for washed emulsion—the one process at full length, the other in outline only. I now give its details.

### Bath Emulsion Process.

In this process collodion is poured into a dish, and when it has set is treated with a silver bath, then with a preservative, and is finally washed and dried. This may be done successfully in various different ways.

*Collodion.*—To each ounce of solvents, composed of equal quantities of alcohol and ether, add ten grains of pyroxyline, and dissolve in it—

| | |
|---|---|
| Ordinary crystallised cadmium bromide ...... | 9 grains, |
| (Or dried bromide eight grains), | |
| Ammonium bromide ................................ | 2½ ,, |
| Ammonium iodide .................................. | 2 ,, |
| Cobalt chloride ...................................... | 2 ,, |

and add a few drops of tincture of iodine to bring the collodion to the colour of sherry wine. No *aqua regia* is to be added, as the acidification is in this case differently conducted.

When the collodion has been poured out and has sufficiently set (not allowing it to become hard, but simply set sufficiently that it does not moisten the tip of the finger), pour over it a silver bath of—

| | |
|---|---|
| Silver nitrate........................................ | 50 grains, |
| Potassium nitrite .................................. | 4 ,, |

to the ounce. Break up the collodion, detaching it from the dish, and transfer the whole to a large glass jar. Allow the flakes of collodion to remain in contact with the bath for three-quarters of an hour with frequent stirring. It will be observed that the silver bath is neutral. It may be used over with a second portion of collodion if duly strengthened. The quantity of silver bath should be about three times that of the collodion.

Next pour off the silver bath into a filter, squeeze the flakes hard, and, when well drained, pour over them the same bulk of water (no more) as the bulk of collodion originally taken; stir up for a few moments only, and pour off again. The object is here to wash off the adhering bath, but not to remove that which has penetrated into the flakes. Next add ordinary acetic acid (No. 8 or Beaufoy's), using the same bulk, ounce for ounce, as was used of collodion. Stir well up, and then (without pouring off the acid) add the preservative, using a bulk of preservative four times that of the original collodion. The preservative may be according to choice. I prefer—

| | |
|---|---|
| Water ................................................... | 6 ounces. |
| Prepared albumen.................................. | ½ ounce. |
| Thick gum water .................................. | ½ ,, |
| Sixty-grain gallic acid (alcoholic) ............ | ½ ,, |
| Sixty-grain tannin, dissolved in water ...... | ¼ ,, |

Adding in the above order; this is essential.

Let the flakes remain in contact with the preservative for ten or twelve minutes, then pour it off, fill up with water, stir well, pour off, and repeat this half-a-dozen times. Let it stand to soak for an hour, and change several times; let it soak another hour, and change several times; squeeze thoroughly out, dry, and emulsify with alcohol, ether, and plain collodion, equal parts.

This gives a good emulsion. No discolouration whatever takes place. The flakes at the end of the washing are pure white, except so far as coloured by the silver iodide.

The process may be considerably varied. Good results were obtained by the following modification:—The collodion was acidified with *aqua regia*, two drops to the ounce, and was treated with a fifty-grain bath of silver nitrate (fused is preferable if potassium nitrite be not added). After being left in contact as before it was washed rapidly with one change of water in the manner above described, and was then treated with—

| | |
|---|---|
| Infusion of black tea.............................. | 4 ounces, |
| Gum and sugar solution ........................ | ½ ounce, |
| Sixty-grain solution of gallic acid in alcohol | ½ ,, |
| Acetic acid (No. 8 or Beaufoy's) ............... | ¾ ,, |

and finished as before. Here the addition of *aqua regia* permitted the acetic acid to be used in the preservative instead of being applied first alone. But if the operator depend upon the *aqua regia* alone, and do not use the acetic acid, the result will be a failure.

Both these processes give good results. The first emulsion is rather the more sensitive of the two; but the other form of process—that in which the silver is applied dissolved in alcohol—gives a more sensitive result than can be obtained with this bath process.

### Washed Emulsion Process.

Of this process I have already sent a detailed description. I have, nevertheless, an important note to add to my former communication. This mode of operating I greatly prefer to any other that I know anything of, and, if I am not mistaken, is destined to become very largely adopted. But it is necessary for success, in order to obtain the very high degree of sensitiveness of which I have spoken, to adhere very closely to directions. Alterations that seem quite insignificant may destroy the good qualities of the emulsion—a fact which I have abundantly proved in the course of my experiments.

I find that the commercial cupric chloride, known as "muriate of copper," is too variable a substance in composition to be depended upon. On trying a specimen from a different maker the plates obtained were very insensitive. I have therefore substituted cobalt chloride (muriate of cobalt) for the copper salt. This last is exceedingly soluble in alcohol. The formula for collodion already given in another part of the present paper is suitable for this process also, except, of course, that *aqua regia* is to be added; also a few drops of tincture of iodine, to bring the collodion to a sherry wine colour.

The collodion is to be sensitised with twenty-five grains of silver nitrate to the ounce. There seems to be a distinct advantage in using *fused* nitrate, and I strongly recommend that ordinary crystallised nitrate be not substituted in its place. The *aqua regia* is to be added just before the silver; the cobalt chloride should be dissolved in a little alcohol and added half-an-hour or an hour *after* the silver. Ten or twelve hours seems to be the best time for keeping the emulsion after sensitising. I now prefer this to the longer time that I mentioned before.

The bath of preservative should remain in contact ten or twelve minutes. The bath first described in this paper (that of albumen, &c.) gives the best results for making negatives. For transparencies the gallic acid and coffee preservative, described in a previous paper, gives better results. It will not need to be acidified.

There is a conspicuous difference in the working of this process and that of the "bath-emulsion" process, that in this the addition of *aqua regia* is a sufficient acidification; whilst with the silver used dissolved in water it is essential that the preservative should be acidified.

In both these processes—and, I presume, in all washed emulsion processes—the dry flakes redissolve in alcohol and ether very slowly. To get the best results they should be allowed four or five days, though the emulsion may be used with success in a much shorter time. Notwithstanding the silver iodide the solid parts remain well suspended. I have used emulsions that have stood for three or four days without having been disturbed. But to get the best and most sensitive films it is generally best to shake up the emulsion a few hours before using. M. Carey Lea.

## ON A METHOD OF ENLARGING.

[A communication to the London Photographic Society.]

In the "good old times" most of the good old plays commenced with a prologue. My play may be bad; therefore my prologue shall be as long as possible. In the race for supremacy most really good things come in first by the very force of their goodness, *but not always.*

The reason why the daguerreotype has become a thing of the past is contained in the fact that, whilst it has been a "thing of beauty," and, I firmly believe, under proper conditions might have become "a joy for ever," it has not had within itself the power of multiplication. On the other hand, however, that which we know as the calotype or Talbotype process (and after it, following in the same groove, the collodion process) has grown into a gigantic success—partly because of qualities unknown in the daguerreotype process which have taken hold of the popular mind, but also largely because the powers of multiplication are very great. But, after all, these are limited; and for extensive publications new methods, such as the Woodburytype and Albertype, have come to the front for book illustration.

The method of what we call negative printing took the lead of other processes because of its powers of multiplication; but if, instead of this, we had had in the early days of photography a method of producing a perfect transparent positive as the first product of our labours, and from this we had had the power of multiplying *ad libitum* our negatives, how much the sphere of usefulness would have been enlarged! and how different would have been the position of photography today! By the method I am about to describe the powers of multiplication are most extensive; for the negatives can be reproduced without limit.

My justification, then, for appearing before you tonight is contained in my prologue.

The examples of my method are before you in your hands. From a photographic point they are not superior to two or three othe

methods of enlargement extensively practised; but for artists they have a quality of texture unknown in other methods. My own feeling on this point is confirmed by several artists of great distinction—amongst others several royal academicians. On this question, however, the tribunal assembled is competent to award a verdict; and I await the decision.

The method I have the honour to describe to you is partly based upon a process of enlargement described by me about ten years ago, and which has since been largely sold throughout the country as a secret process. In the paper I refer to I dwelt upon the fact that if a transparency were made larger than the negative required some of the defects were reduced instead of being increased. This is so clear that I need not now dwell upon this point.

I have always had a great affection for paper negatives. I have not yet forgotten my first great delight, nearly thirty years ago, when I was permitted to see a paper negative developed; and I can now say, after all these years of experience, that the pleasure now felt in producing a good collodion negative is nothing in comparison to it. I am sure all here who have practised the calotype process will reiterate my words.

Well, now, without any more circumlocution I will briefly describe my process.

I produce at one operation a transparency of the size required. The best method I find for this is to use a reflector of looking-glass, fixed outside one of the windows of the studio at an angle of 45°, and using north light only, never sunshine. This reflected light falls on a sheet of fine ground glass, which has replaced one of the ordinary squares of the window. All the light not needed is shut out by a piece of millboard. A hole of the requisite size is cut in this, and the negative is fastened by drawing-pins to the millboard. The millboard fills exactly the pane of ground glass, the square side of which is, of course, turned outwards.

A long bellows camera is now brought into position and a glass transparency is made from the negative. The exposure is very important, and the time can only be learned by practice. The image is developed with a weak solution of iron (about ten grains to the ounce); and when the detail is fairly out a much stronger solution may be employed to give force. I would here say, *en passant*, that all photographers are much indebted to Colonel Stuart Wortley for his demonstration of the importance of strong solutions for giving force after all the details are brought out by weak ones. It is important for my method that the transparency shall have every detail possible, and, at the same time, as much power as can be obtained; indeed, all the force of a good negative must be there, but in reverse. The transparency must be fixed and varnished in the usual way. When the varnish is hard all the transparent spots can be mended; and if the shadows are weak in places artistic touches of Indian ink or other colour can be employed either on the front or wrong side at will.

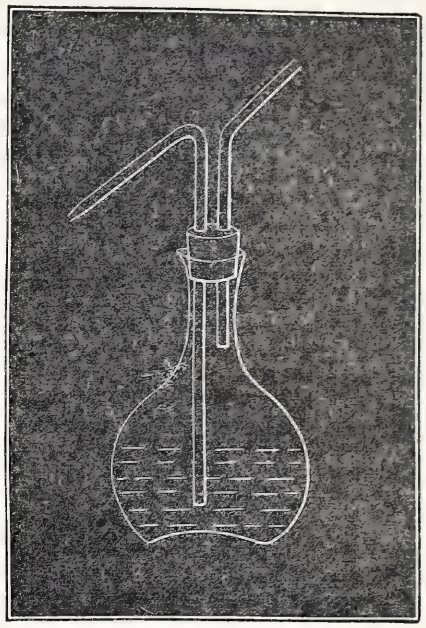
Prints on paper are now to be made from the transparency; and they do not need toning, for the colour given by the hypo. is better for the after process. When the print is well washed it is dried; and now any defects of the opposite kind can be touched out.

The next process is to wax the paper negative to make it more transparent. This is best done by the aid of a flat iron. The print should be made very hot by the frequent passing of the iron, and whilst still hot rubbed with a cake of white wax. Alternate ironing and waxing will soon get a tolerable film of wax all over the negative; but a little skill will be necessary to do this part of the process nicely. The print should now be put between thick blotting-paper to remove the superfluous wax, and the paper negative is now ready for use as an ordinary printing negative. It should be much over-printed, for the waxing process reduces the strength immensely. The right depth, of course, can only be found out by practice. It will be seen that by this method the original is not used except for the transparency, and that the negatives can be made *ad libitum* from the transparency by an ordinary printer. If, therefore, a large number of copies were needed in a hurry it is only necessary to multiply sufficiently the number of negatives from the transparency to supply the demand. V. Blanchard.

## ON THE USE OF PHOTOGRAPHIC AND CHEMICAL APPARATUS.

CHAP. XI.—ON MISCELLANEOUS APPARATUS.—(Continued from page 163).

Washing Bottles.—It is often desired to transfer the whole of a precipitate from a filter or from one vessel into another; but it is difficult to avoid leaving a small quantity behind. The last trace, however, may be obtained by inverting the filter or vessel over the receiving vessel and washing the precipitate into it by projecting a stream of water, hot or cold, over the whole surface of the filter by means of a washing bottle, one form of which is here shown. The mouth being applied to the short tube and air blown in from the lungs, the water is sent through the fine orifice of the pointed tube with a force which can be regulated by the lungs. A large india-rubber ball may be used instead of blowing with the mouth.



As with this washing bottle pressure from the lungs has to be exerted all the while the stream of water continues, a slight alteration has been designed to obviate the inconvenience. Across the inside end of the blowing tube a slit of sheet india-rubber a trifle wider than the tube is passed, and secured in its place by pinning down each of its ends to the cork. It thus forms a valve, one strong blow with the mouth sending enough air into the bottle to continue forcing the liquid out for some time after the mouth is withdrawn. When a very copious stream is not required a still simpler automatic bottle may be made by using only one tube (the exit tube), which must reach to the bottom of the bottle, and blowing strongly down it. The air will then pass through the water, and, accumulating in a compressed state above it, eject the contents till its force is expended.

*Connecting and Luting Apparatus.*—In joining glass tubes for various gas apparatus and other purposes the simplest and most efficient plan is to pass a small piece of india-rubber tubing over the two ends. A temporary tube may be made from pure sheet rubber not vulcanised. A piece wide enough to go round the tube and leave a little to spare is wrapped round the two ends, and the loose edges cut off by a single cut with a pair of scissors. If this be done close to the glass the india-rubber will just encircle the tubes without overlapping. The freshly-cut edges will be adhesive enough to make a pretty strong joint, and, if put together without loss of time, a perfect tube will be formed. It would be made stronger and more secure by surrounding it with a second tube similarly made. When the glass tubes to be joined are of very different diameters the smaller one may be inserted through a cork tightly fitted into the large one, bearing in mind that a glass tube will not bear without breaking nearly so tight a cork as would a well-made bottle with a neck of the same diameter. With acid or corrosive gases all connections must be made air-tight; cork alone would not suffice either at a joint or at the mouth of the generator, and for this purpose the joints should be smeared over or surrounded with luting. This is a tolerably stiff paste made of various ingredients according to the circumstances under which it will be used. When no heat is applied a mixture of lard and wax, in the proportion of ten to one, will be an efficient preparation; the cork should be rubbed well over with it, and all holes and crevices carefully filled in.

When heat is to be applied a useful luting will be made by rubbing up a little linseed meal in the palm of the hand with sufficient water to make it into a stiff paste. It can then be spread neatly and evenly all round the joint, or tied on with a piece of moistened bladder. When two or three tubes are fitted into one cork they can be made quite secure by wrapping a piece of paper round the cork so as to project about an inch above its surface, and then, after tying it securely, pouring in some plaster of Paris (mixed immediately beforehand with enough water just to render it fluid) to the depth of about half-an-inch into the shallow reservoir formed by the paper. When the mixture is set the paper can be removed and the plaster trimmed into shape with a knife. For apparatus in constant request the corks are treated in the most useful and finished-looking manner by painting them over with a solution of red sealing-wax in methylated spirit of wine; this, however, takes some days to harden.

If a permanent connection be required—as, for instance, in securing the tube in a Liebig condenser—a mixture of white lead, such as painters use, with whitening, or dry white lead in a fine powder

will answer well. It hardens in time to a very firm, solid cement. For strong connections where corrosive vapours pass a mixture of raw linseed oil and pipeclay well beaten together will be, perhaps, the best mixture possible. Some operators replace the oil by a very strong solution of glauber's salt. There are times when a piece of well-worked, stiff clay will answer as well as anything. It would, however, of course soon become useless if dried by exposure to heat.

*Corks.*—Frequent allusion has been made to the necessity of using good corks, and in few things is there such difference in quality. The best corks have a pleasant, velvety look and feel; the common are full of holes, cracks, and fissures, fall easily to pieces, are hard and non-pliable, and, when used for bottles, are constantly discharging little particles of dust and small pieces of cork into the contained liquid. All corks before being used may be rendered much more pliable and elastic by squeezing them in a cork press, or with tongs made for the purpose. The cork should be turned round while in the press two or three times so as to submit it to pressure in all directions; the difference between pressed and unpressed corks is most marked. If a press or tongs be not handy the cork can be much improved by a gentle squeeze or two between one's teeth. When not in use they should, if attached to any fittings and the apparatus allow it, be loosened or taken out of the vessel they are fitted to, otherwise their elasticity would gradually be lost. Care is always needed in fitting a cork into a glass tube, as the latter flies into pieces with a very little pressure; the cork should always be squeezed first to render it soft and elastic. For piercing corks with holes of the requisite size to receive tubes Mohr's cork borers are most useful; these are cylinders of metal sharpened to a fine cutting edge at one end, and having a flange soldered on to the other to strengthen them and prevent their chafing the hands when used.

They are to be had of all diameters to suit the varying sizes of glass tubes, and are usually sold in sets or nests, the flanges, when the borers are put away, serving to keep one within the other without slipping out; and within the smallest is generally placed a small rod to push out the cylinders of cork formed in cutting. The cork to be bored should be placed firmly against a solid support, and the borer pushed in with a screwing motion, carefully holding it perpendicularly or it would find its way out at the side instead of at the end of the cork. In boring large apertures the instrument should be slightly greased. It is not always possible to get the aperture of the exact diameter required. A rat-tail rasp can be used to enlarge it, and a similarly-shaped file to trim it and make it smooth. These same cork borers can be used to pierce india-rubber stoppers. They should, however, be particularly clean and sharp, and they require to be repeatedly wetted with spirit of wine during the operation.

G. Watmough Webster, F.C.S.

## PHOTOGRAPHY IN PERMANENT PIGMENTS, WITH RECENT IMPROVEMENTS IN AUTOTYPE TRANSFER.

[A communication to the London Photographic Society.]

There is no branch of photography more interesting in itself and more worthy of consideration than that which relates to the production of photographic prints in a permanent and unalterable form; and here at the very outset it is worth while pausing to inquire what effect a statement like the preceding (which implies that photographs *are* produced in a form *otherwise* than permanent) must have upon those outside the profession, who are not supposed to know or to inquire too curiously into the *modus operandi* of a process giving them pictures which seem, for a time at least, to be perfectly unexceptionable.

Surely it must be a matter of grave reproach to the votaries of this handmaid of science and art if it be true that faithful transcripts produced by the unerring pencil of light, the *actual* "holding of the mirror up to nature," however beautiful in colour, exquisite in delicacy, and wonderful in definition, will, like the "baseless fabric of a vision, *fade* and leave not a wreck behind." Fortunately this is true only in part; I hope to be able to demonstrate this evening that there is a method, the slow growth of years, the result of careful experiment and conscientious work of many minds, by which permanent photographs may be produced with almost, if not quite, as much facility as the universal production known as silver prints.

Can anything be more disheartening than to look through a costly album or scrapbook containing silver prints which have been in existence, say, only half-a-dozen years (portraits of friends, perhaps passed away for ever), but are yellow, faded—the mere ghosts of what were once satisfactory mementos, views of places and objects which served to call up pleasant memories? The proverb says "whatever is worth doing at all is worth doing well." Do we *do* photography *well?* Do we do it justice? This defect of want of permanency has stimulated the efforts of men of note in England, France, and Germany to find out a remedy, and the honours are pretty equally divided between the three countries; the result has been the invention, and making practicable, of at least three different methods, all of which produce photographs in *unchangeable* materials. They have a common foundation, namely, the peculiar action which light has upon bichromates exposed to its influence in contact with organic matter. These three methods are designated respectively the "autotype," the "Woodbury" or relief process, and the "collographic printing" process. It is with the first of these that I propose to occupy your attention during some portion of this evening. An autotype is a production (by the action of light through a negative or other partially-transparent medium) of an image or picture in permanent pigment.

To Mungo Ponton must be attributed the discovery that paper, or similar material, immersed or treated with a solution of bichromate of potash or ammonia became changed when exposed to light. Becquerel found that paper treated with size, gum, or gelatine was acted upon more rapidly than paper not so treated. This fact suggested to Poitevin that it might be possible, by mixing a pigment with the gum or gelatine, to produce a picture by the retention of those parts acted upon by light, and the washing away of the portions upon which the light had not acted; but here was the first stumbling-block. Poitevin spread his layer of gelatine containing a pigment upon paper, sensitised it with a solution of bichromate of potash, exposed it to light under a negative, then tried to wash away in hot water those parts upon which the light had not acted; to his surprise he found this impossible. On substituting albumen for gelatine, and applying a coating of extreme thinness, he succeeded in obtaining copies of engravings and drawings when the picture was produced by absolute *lines* or *stipple.*

The late Mr. Blair, in England, and the Abbé de Laborde, in France, almost simultaneously hit upon the cause of Poitevin's failure. They showed that the action of the light induced a very thin, insoluble film over the whole surface of the picture which had been in contact with the negative; therefore, in order to be able to attack the gradations of solubility corresponding to the gradations of intensity in the negative, the operations must be directed to the back of the picture. To effect this they spread their gelatine on very thin paper, as transparent as possible, and, imposing this material upon a negative, with the thin paper in contact with its surface, printed the image *through* the thin paper.

It is easily comprehensible that by such a procedure the back of the picture could be at once got at for the purpose of development; and the action of warm water proved quite sufficient to remove those portions of the gelatine to which the action of the light had not penetrated, and which were, consequently, soluble.

From this it will be seen that an autotype picture is really a relief, the elevations and depressions thereof being due to the greater or lesser amount of penetration of the light into the film, this being in accordance with the gradation of light and shade in the negative. The light parts of the picture are those where the light has had a feeble action; and the greater portion of the gelatine and pigment being washed away in development the film is so thin in these places as to allow the paper or material upon which the picture is placed to show through, the half-tones and deep shadows being correspondingly made by the varying thickness of the pigment.

Passing over the many ingenious methods suggested for doing away with the necessity of printing through the thin paper by which the gelatine pigment had been supported, we arrive at the invention and working out of a really practicable method of printing in permanent pigments by Mr. Swan, of Newcastle-on-Tyne. This gentleman made a tissue of gelatine and pigment by coating a sheet of glass with collodion; upon this he spread his compound, which, when dry, he stripped from the glass. He placed the collodionised side of this tissue in contact with the negative in the pressure-frame. *Before* development he cemented the surface which had been in contact with the negative to the surface of the paper or support upon which it was desired it should remain with some material insoluble in hot water. The development was therefore carried on from the back; and the various grades of the picture appeared by the washing away of more or less of the gelatine in accordance with the gradations of light and shade in the negative. The idea soon struck him that the troublesome method of making the tissue as described could be dispensed with, and that the pigmented compound could be made upon ordinary paper if it were possible to remove this paper before development. It must be borne in mind that an autotype picture cannot be developed from that side which has been in contact with the negative, because it is covered with an insoluble film, and that

the action of the light penetrates to a greater or less depth into the gelatine compound according to the intensity of its action. It would follow from this that if the compound were in sufficient thickness on the paper the light would not *anywhere* penetrate its *entire* depth; and as there would be a film of total insolubility on one surface, there would be a layer of complete solubility on the other.

Mr. Swan coated paper with the pigmented gelatine of considerable thickness. This, when dry, was exposed under a negative to the action of the light; then, before development, it was coated with a solution of india-rubber, and laid upon a piece of paper similarly treated. The two were then pressed into contact by means of a rolling-press. On placing these conjoined sheets in warm water the soluble layer of gelatine in contact with the paper upon which it had been spread (that is, at the back of the picture) became softened and dissolved by the action of the water, allowing the paper to be stripped off, thus leaving exposed the back of the picture, which the action of the water speedily developed, by removing that portion of the gelatine which still remained unacted upon by light, and therefore retained its original solubility.

But here another difficulty presented itself. A little consideration will show that a picture so produced (if from a negative taken in the usual manner) will be reversed. To remedy this Mr. Swan carried on the operation one step further; he coated paper with gelatine treated with alum, so as when dry to form a nearly insoluble compound. Upon this paper, in a moistened condition, he laid down the developed picture, to which it adhered firmly, the picture being now imprisoned between two pieces of paper. When dry the india-rubber-coated paper covering the *face* of the picture was moistened with benzine, which, dissolving the rubber, allowed the paper to be peeled off, and disclosed a photograph in permanent and unalterable pigment.

Without doubt Mr. Swan succeeded in working out an absolutely perfect method of producing photographs in permanent pigments; but, at the same time, it cannot be denied that the method was not an easy one. It involved the use of costly apparatus, and it was scarcely calculated to meet the wants of those members of the photographic profession who contemplate the printing of permanent photographs from their own negatives.

To Mr. J. R. Johnson we are indebted for the invention of a method of double transfer, doing away with the india-rubber-coated paper, and which went a very long way towards making the process simple and easily workable. His method is based upon the fact that if two impervious surfaces are pressed into contact, and the air entirely removed from between them, they will adhere, by virtue of atmospheric pressure, without the necessity of using any cement or adhesive material at all. Here we have a distinctly new principle, which Mr. Johnson applied as follows:—

The pigmented tissue being printed it was immersed in water, and when it had become just limp was laid down upon a plate of metal, glass, slate, or other impervious body. This was called the "rigid temporary support." The air and water were pressed from between these two surfaces by means of a sort of india-rubber edge fixed into wood, and known as a "squeegee." The two surfaces so forced into contact were allowed to remain for a few minutes, then placed in the hot water, which, dissolving the layer of soluble gelatine immediately in contact with the paper, allowed the paper to be stripped away, the back of the picture being consequently exposed, and the conditions for successful development fulfilled.

The problem of how to produce permanent photographs with ease seemed now to have received a satisfactory solution. The operations were not difficult, they required no costly apparatus, and the materials employed were not expensive. Why, then, did not this improvement at once give rise to a vast development in the direction of permanent photography? Mr. Johnson had, it is true, patented his invention; but it had been practically thrown open to all comers—the only conditions being that the tissue and material used should be purchased of the company formed to prosecute the enterprise.

In autotype printing the standard of excellence sought to be attained has been the exquisite, though fleeting, beauty of a silver print. These productions are eminently beautiful; the toning with compounds of the precious metals gives a variety of rich, beautiful colouring. The paper upon which the photograph is printed is of a very fine quality, and the finished picture is susceptible of a very high glaze and finish. It is not improbable that, for small pictures, autotypes made by this process of double transfer did not present that delicacy and finish which would make them acceptable to the profession and to the public.

With large work the reverse was the case. For reproductions of paintings, drawings, sketches, engravings (especially of a large size) this process at once showed its superiority; for, besides the value attaching to these productions by reason of their *permanent* character, there was an additional element of satisfaction in the fact that they reproduced not only the colour of the originals, but in many cases the very material in which the original was worked. Thus a *facsimile* of a drawing in red chalk would be reproduced in a tissue having red chalk for its pigment, and similarly with respect to other colours.

And now another step forward was made. It will be remembered that prints from ordinary negatives appear reversed, and need another transfer to cause them to appear in their correct relation. To save time and trouble it was considered desirable to *reverse* the negatives; and in copying pictures, works of art, and those objects to which autotype printing seemed particularly to lend itself, this was accomplished by means of the reversing mirror.

This proceeding reduced the number of operations to a minimum, and a great success was at once achieved by those who adopted this method of producing their negatives.

Printing from reversed negatives is known as the operation of "single transfer," and is conducted as follows:—The only materials required are the pigmented tissue and a paper coated with insoluble gelatine known as "single transfer paper." When the tissue has been printed under the negative it is immersed in cold water, together with a piece of single transfer paper rather larger than itself. These are brought into contact under water, lifted out together, laid upon a slab of slate or piece of sheet zinc, and pressed into contact with the squeegee; allowed to remain for a few minutes, then placed in warm water. The soluble gelatine at the back of the picture soon begins to dissolve, releases its support (the paper), which is stripped off and thrown aside. The development is continued, and, when complete, the picture is rinsed in cold water and placed for a few minutes in a weak solution of alum, which indurates the gelatine. It is then rinsed in the cold water, hung up to dry, and, when dry, is ready to trim and mount.

It is apparent that the operation just described cannot well be more simple; and for small pictures it was found that there was always a more crisp definition and sharpness of line than could be obtained by the transfer from a rigid surface. To discover *why* this should be the case was the next problem.

It occurred to me that the cause was to be found in the yielding nature of the support upon which the picture was developed—namely, the transfer paper. It will be remembered that, in the process just described, the printed tissue and transfer paper were put into contact in a moist condition; consequently, they expanded or contracted together—there was no strain between the two surfaces. But if a limp and yielding surface like wetted tissue be laid upon an absolutely rigid support, such as a plate of zinc or porcelain, is it not likely that there will be a strain set up between the two surfaces, by reason of the contraction of the damp tissue as it partially dries? and will not this be of itself quite sufficient to impair the delicacy and crisp detail of small photographs? Mr. J. R. Johnson had suggested the use of a paper coated with an ammoniacal solution of lac; but, dealing as he did mostly with large work, he did not insist upon its value as a yielding surface, even if he were aware of the fact. Taking, then, the idea that the superior quality of pictures produced by the single transfer process from reversed negatives was due to the soft and yielding film upon which they were imposed for the purposes of development, I endeavoured to discover if some such basis could not be found for prints from ordinary negatives; the material to be perfectly soft and yielding when wet, to receive the limp tissue as it were on a soft *couche* or bed, to retain it perfectly during development, and finally to give it up easily when the development was completed. After many experiments and repeated failures I at last hit upon a combination that after a very long practical trial seems to answer perfectly; and the ease with which it is manipulated is not the least portion of its merit.

This tissue, which I have named "flexible support," and for which I have obtained a patent, is paper treated first with a coating of gelatine rendered insoluble by means of chrome alum; this, when dry, is coated with a solution made by dissolving (at a high temperature) lac by means of borax and soda.

The coating of gelatine forms the bed or *couche* upon which the picture is held during development, the lac being the resisting coating which enables the print to leave the surface when finally transferred.

The mode of preparing the flexible support is this:—A solution of gelatine is made of variable strength, according to the quality of surface desired in the finished print. For a print to have a dead or matt surface I employ about a five-per-cent. solution; for a more highly-glazed surface about seven and a-half per cent; and for a surface about equal to highly-glazed albumenized paper a ten-per-cent. solution. Paper wound upon a reel, so as to be in a long

length, is coated upon a carbon tissue-making machine with these solutions, and when dry is cut into sheets and subjected to a pressure of many tons in a hydraulic press. The solution of lac is made by dissolving one pound of button or bleached lac in five quarts of water, in which has been dissolved four ounces of borax and one ounce of soda. This is put into what is called a "digester," and heated until the lac is dissolved; the solution is then filtered, and when cold is ready for use. The gelatinised paper is floated upon this solution in a shallow bath or tray, hung up to dry, and then finally rolled between metal plates in a rolling-press. Each sheet is rubbed over with a little of a solution made by dissolving resin in turpentine and adding thereto a few grains of wax. This was employed by Mr. Johnson to rub over his rigid support to prevent final adhesion, and was, I believe, used by Firling in a very early stage of carbon printing. As soon as the spirit has evaporated the flexible support is ready for use.

The mode of using is extremely simple. After the tissue has left the frame it is plunged into water with a piece of the flexible support a little larger than itself. The two surfaces are brought into contact under water, avoiding air-bubbles, lifted out together, and hung up in the air for a period which may vary from ten minutes to one or two hours, as may suit the convenience of the operator. The adhering sheets are then plunged into warm water, and the paper upon which the tissue was made peels off. The picture is developed, and, when finished, is slipped into cold water, thence into the alum bath, and, after rinsing, is then ready for the final transfer.

The material upon which the picture finally rests is paper coated with gelatine containing sulphate of baryta as an emulsion in the solution, and rendered partially insoluble with chrome alum. Pieces of this paper are cut to the proper size and immersed in hot water to soften the gelatine. The picture to be transferred is placed in contact under cold water, the two are lifted out together, hung up to dry, and, when dry, the finished picture leaves its temporary support with the greatest ease.

The temporary support may be used repeatedly by rubbing it over with a little of the repellent solution of resin and wax, and will last a very long time. I hope to convince you by practical demonstration that the process is very simple, very easy, not liable to failure, and that the results are such as will bear comparison with the best work of the silver printer; whilst, if I can convince you that these productions are "things of beauty," I can assure you they will be "joys for ever." J. R. Sawyer.

## FOREIGN NOTES AND NEWS.

### The Present State of German Copyright.—Combination Printing.

If we may judge from the following extract from the *Photographische Correspondenz* there is at last a faint glimmering of hope that at some future time the disgraceful state of the German photographic copyright laws, or, rather, want of laws, will be reformed. Its present state is notoriously unrivalled by any similar law in the civilised world, that of American literary copyright excepted; but when German writers begin to speak out and call "a spade a spade" and an unauthorised counterfeit of a photograph a fraud and a theft, and when the judges of the land begin to realise the possibility of the existence of photographic copyright, and that such copyright is as much the property of the copyholder as the copyright of an engraving of a bank note, then a better day will dawn for photography in Germany. Meantime let us join heartily in the cry—"*à bas les pirates!*"

"The question of how the photographer can be protected against that unauthorised copying of his productions which our English *confrères* designate 'piracy' has for some years back occupied an important place among the subjects discussed in photographic societies and journals; but all their discussions have had no effect in altering the laws. It must be recorded with regret that in many countries where all other branches of graphic art or industries are protected by copyright law photography has no rights. Let us look, for instance, at Prussia. There we shall find that, in order to protect themselves from their own *confrères,* the first photographers in Berlin do not send their portraits of eminent persons into the market unless they have a large stock of prints already on hand. If they neglect to take this precaution, then a few days after the publication of a picture they will most likely find the market flooded by unauthorised copies issued by the well-known firm of ———, and other photographers whose apprehension of *meum* and *tuum* seems yet to be a little hazy.

"The exertion of the photographic societies of Berlin and Dresden have led to an unforeseen and disastrous result, namely, the withdrawal from the draft of a bill for the protection of the copyright of works of literature and art of the paragraph relating to photography and its amplifications into a separate memorial. It is to this very doubtful distinction that the German photographers owe their present unprotected condition, while the productions of geographers, naturalists, architects, technical and suchlike *(sic)* representations are protected against counterfeits by the forty-third section of the imperial law of June 10, 1870.

"In Austria photographers are much better off, since the judicial authorities have been advised that the decree of October 19, 1846, for the protection of literary and artistic property against unauthorised infringements, imitations, and counterfeits might be interpreted as including photographs, and have based on its application to photography an important series of decisions.

"One of these decisions was in the case of a certain Johann Knizek, who was condemned, in conformity with the 467th article of the penal law, to pay fifteen florins, with the alternative of three days' imprisonment, for selling reproductions of the pictures of several Viennese photographers. Besides the fine imposed 587 of these pictures were seized and destroyed; and the sale of the pictures in question was prohibited, even if they were procured out of Germany. (It may be remarked that the name of the firm entered on the register of the Chamber of Commerce as fined for the sale of photographic reproductions is not "Johann" but *Marie* Knizek).

"Since the principle seems to be recognised that the unauthorised imitation of a photograph may render the imitator or publisher of the imitation liable to an action at law, we will not enter into the question whether the sentence in the case referred to will be sufficient to deter the delinquent and others from such contravention in future. We cannot refrain from clinching the above with a proverb that we had occasion to quote quite lately when a metal manufacturer was bemoaning the numerous counterfeits of his models that had found their way into the market—'Where there is no plaintiff there is no judge.' If the Austrian photographers, then, wish to reap the advantage of the protection which the law can afford them they must not shrink from the formalities required by the law nor from the consequent notoriety; and they must have sufficient public spirit to be regardless of an occasional money loss.

"We are convinced that it is only by having repeated recourse to the intervention of the law that the evil referred to can be mitigated. The sure result would be that, on the one hand, the persons seeking redress would soon become familiar with the formalities and so find them less burdensome, and, on the other hand, it would be proved to the aggressors that the production and sale of illegal imitations is simply theft and reset of the same. Lastly: the repeated appeals to legal intervention would call the attention of influential personages to the want of an alteration in the law of copyright so as to adapt it to the times.

"We hope soon to have the pleasure of receiving from official quarters the details of these much-desired modifications of the law of 1846, as well as of the simplification of the legal forms which have until now been imperative before judgment could be obtained."

Herr Riewel gives us a rather ingenious illustration of the proverb—"Necessity is the mother of invention." A *carte-de-visite* group of three persons was brought to him, and he was asked to make a half-length, cabinet-sized portrait of the person in the middle, whose head only was visible. This person was dead, and this *carte* was the only portrait of her in existence. Herr Riewel first enlarged the head from the *carte* to the desired size, coated the plate with a solution of gum, and when it was dry he traced the outline of the head upon a piece of paper, and carefully removed all the film from the plate except the part on which was the head itself. He then chose one of his female assistants who seemed to be about the same height as the deceased, and took her portrait in the usual manner, taking care that her head did not cover a larger ground than that of the enlargement. This plate was also coated with gum, and allowed to dry. When it was quite dry he laid the paper on which the outline of the enlargement was traced upon the head of the second negative, and pricked out the same outline upon the film with a needle. The paper was then lifted off, and the film, surrounded by the needle pricks, carefully removed. The two negatives were then adjusted, and printed from as one.

## RECENT ADVANCES IN PHOTOGRAPHIC SCIENCE.

### Society of Arts—Chemical Section.

A lecture on *Recent Advances in Photographic Science* was delivered at the House of the Society of Arts, by Mr. J. Spiller, F.C.S., on Friday evening last, the 16th instant. There was a fair attendance,

of which a preponderation consisted of photographers. The chair was occupied by Mr. Warren De la Rue, LL.D., &c.

Mr. Spiller commenced his lecture by alluding to the fact that in that very room, on the 20th January, 1853, the London Photographic Society had been founded. The collodion process had only been introduced a short time previously, and by it a great impetus had been given to photography. The publication of the *Journal of the Photographic Society* had followed, and in the early volumes of it were to be found the contemporaneous history of an art which had in later times borne fruit such as had rarely been equalled in other departments of applied science. As respects the collodion process, with the exception of an increase in the proportions of bromide and alcohol no advance had been made. Cadmium salts, too, were in general use as sensitising agents, and some operators were preferring pyroxyline made from paper, as recommended by Dr. Liesegang and others. Emulsion processes were gaining ground. These enabled them to dispense with the use of the nitrate bath. The collodio-bromide process of Messrs. Sayce and Bolton was, he said, based upon Mr. Simpson's researches in collodio-chloride. Colonel Wortley had advocated the introduction of nitrate of uranium in the emulsion collodion, his formulæ being still on their trial. The advantages claimed for that addition were greater sensitiveness combined with superiority in rendering colour—an effect believed by Dr. Vogel to be obtained by mixing colour with the collodion film.

Regarding dry plates Mr. Spiller believed that his own researches, coupled with those of Mr. Crookes, led the way. He published a process, in 1854, by which plates were preserved for some time by the use of nitrate of magnesium. A variety of other processes—such as the collodio-albumen and gum-gallic—subsequently followed, succeeded, in turn, by the albumen and beer process of Captain Abney, the preservative mixture in this latter instance being such as to warrant him in designating it as "egg-flip."

In enlargements, Dr. Monckhoven had made use of collodio-chloride transparencies, and Mr. Pritchard had also used this agent in reproductions. Enlargements had also been made upon collodion by Mr. Jabez Hughes, of Ryde, transparent pictures being developed upon glass and afterwards transferred to paper or opal glass. Pictures produced in this mode Mr. Spiller believed to be permanent. A principle similar to that was employed in the production of photo-enamels, the film in this case being transferred to porcelain or enamelled copper, and then subjected to the action of fire. Mr. Blanchard had recently described an enlarging process of great merit. Mr. Edwards had also produced good enlargements, and Messrs. Spencer, Sawyer, Bird and Co. used the autotype process for the same purpose, the result being numerous fine enlargements, examples of which were to be seen upon the walls. Although both by carbon and the Woodbury method of printing good transparencies were produced, simple collodion transparencies, when properly toned, were equally good. He instanced the lantern slides of Mr. York, and an enlarged transparency of the moon by Mr. De la Rue, the Chairman, as works by the last-named process. The transparency of the moon, alluded to, was handed round for inspection. This, the lecturer said, was given to him in 1860 by the Chairman as a specimen of his own work.

Mr. Spiller then dwelt upon the subject of the want of permanency in ordinary silver prints, saying that the charge of instability was sustained by a mass of evidence. The cause of the fading was traceable to the use of hyposulphite of soda as a fixing agent. Among the foremost of the methods for ameliorating such fading by careful manipulation and paying attention to the chemical manipulations was the addition of the ammonia to the fixing bath, followed by washing of the print in hot water. The albumen used in the preparation of the printing paper introduced another element of uncertainty; for that substance contained a certain proportion of sulphur which, when the albumen underwent decomposition, was set free to act upon the silver, and no certain method of counteracting the evil was known. Fading was also caused by the hyposulphite of soda used as an antichlor in the mounting-boards, and when present in the cards defeated all efforts previously made in fixing and washing the print itself.

In seeking for a remedy against fading uranium printing offered grounds for hope; but, apart from the facts that the permanence of the prints produced by it had not been proved and that it was a costly metal, the necessity of appealing to such a process had been obviated by the progress made in carbon printing, in connection with which he was not aware of a single case of fading having ever been recorded. The pigment itself was unchangeable, and so he thought could be affirmed of the combination of gelatine and chromic oxide which formed the material by which the atoms of carbon were bound together. Parchment they knew to be unalterable, and yet that was but a film of gelatine which was not tanned, and was soluble in hot water. That material, when tanned or indurated with certain metallic salts, became quite insoluble. A final washing of the picture in a bath of tannin would make assurance doubly sure.

Mr. Spiller next referred to a paper read on the previous Tuesday evening, by Mr. J. R. Sawyer, at the meeting of the London Photographic Society, and gave a synopsis of it, reading several portions *in extenso.* This we need not further refer to, as the paper itself appears in another page of this number.

The subject of photolithography was next introduced, allusion being made to some of its applications and a few of those who worked the process, among whom were Mr. Butter, of Woolwich Arsenal, Mr. Griggs, and Sir Henry James, as well as Captain Abney, who was working the papyrotypic process invented and patented by him. Under this same category too came the Dallastype (of which specimens were shown) and the electro-photographic process of Hancock. Photolithography, in the simplest form, was practised by exposing under a negative a sheet of paper previously coated with gelatine and bichromate of potash, then coating it uniformly with lithographic ink, and submitting it to the action of warm water, by which the lines of the image alone were left, leaving a transfer ready to be laid down upon a lithographic stone.

Another class of processes was that of which Pretsch's photogalvanography was the type, and from which printing surfaces in metal were obtained, the depressions and heights in such surfaces corresponding with the lights and shadows in the photographic negative.

Next in turn came the collotypic process of Albert, of Munich, which was briefly described. A thick plate of glass was coated with bichromated gelatine, and when dry was exposed to light under a negative. That caused certain portions to be non-absorbent of water, other parts absorbing it according to the ratio of protection from light. The surface thus obtained was then inked and printed from as if it were a lithographic stone. Several works issued from the Ealing and Heliotypic works were mentioned as having been produced by that or analogous processes of printing.

The lecturer concluded by giving a description of the Woodbury process, which was now being extensively used for book illustration or for any purpose involving the production of large numbers. Among London publications illustrated by its means was the *Figaro Programme*, a weekly publication, and the *London Sketch Book,* which was a monthly periodical.

Some remarks on Mr. Spiller's lecture will be found in another page.

The Chairman, Mr. Valentine Blanchard, Mr. J. T. Taylor and others made a few observations on the subjects brought forward.

On the table and around the walls were placed a large number of pictures executed by various processes; and at the close of the lecture Mr. J. R. Sawyer repeated the experiments he had made at the close of the meeting of the London Photographic Society on the previous Tuesday evening.

## Correspondence.

M. Leon Vidal and his Photometer.—Decantation of Collodion.—Cleaning of Glass, Old Negatives, &c.—The Late Balloon Accident.

In my last communication I had the honour to inform the readers of The British Journal of Photography of a lecture given by M. Leon Vidal on carbon printing before the Photographic Society of France.

M. Franck de Villecholle, the well-known photographer and French agent of the Autotype Company, rose and, in offering a welcome to M. Vidal in the name of the carbon printers, expressed a great desire that M. Vidal would do all that lay in his power to popularise the use of his photometer, which he (M. Franck) was certain was a much superior instrument to the photometers generally in use, but which, unhappily, could only be obtained by the few.

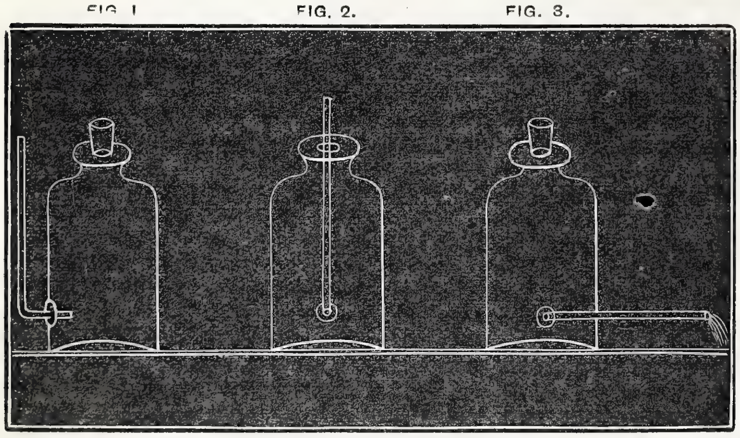
M. Vidal, in a few well-chosen words, thanked M. Franck for his kind and friendly observations. He said that he should always be most happy to further the advancement of the photographic art, and that the kind words and friendly reception of that evening would stimulate him to new exertions. As to his photometer he should be most happy, *pro bono publico*, to give the right of fabrication to any manufacturer who would give him (M. Vidal) the necessary guarantee that he would turn out perfect instruments, for he would never permit his name to be engraved on a paltry one. He informed the Society that he had sought in vain for a manufacturer who would undertake its construction. No one would give him the guarantee that every instrument would be exactly like the model; they found the difficulty of construction too great. M. Vidal then informed the members present in what this difficulty consisted—how his photometer was made with layers of mica, and the difficulties to be overcome in obtaining that substance of the same thickness and density. He is obliged to take a great number of pieces of the same size and then weigh them; he then separates them one from the other according to their weight. When this is done he places them in a printing-frame; a piece of albumenised paper sensitised with chloride of silver is now laid upon them, and after a short exposure a second choice is then made. All these operations are troublesome. It is true they are not difficult, but great

delicacy and attention are required—too great, in fact, for operations on a large scale.

I imagine this difficulty could be overcome and the operation simplified by replacing the mica by a pellicle of gelatine or collodion, which could be tinted according to the wish of the manufacturer by chrome salts, or what would, perhaps, be more durable, the chloride of gold. M. Vidal has made a very generous offer to manufacturers in general, and I have no doubt that ere long his offer will be responded to, and that carbon printers will have no difficulty in procuring his photometer, which, according to M. Franck and others who employ that instrument, "is as ingenious as it is truthful in its indications." I have not yet had the pleasure of seeing the apparatus; but let us give it a welcome, for it would, indeed, be a great boon in carbon printing to possess a reliable instrument. Thus a great stumbling-block to the general introduction of carbon printing—the difficulty of judging the time of exposure—will be removed, and the public may expect every photographer to do his duty by putting into their hands a *chef d'œuvre* which is not liable to deterioration.

I have had the pleasure of receiving several letters from my readers expressing their satisfaction with the working of the decanting apparatus described in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1875, page 51. In the cases of a great number of photographers too much collodion—and, therefore, money—is lying on hand. I will endeavour to describe a means of overcoming that difficulty. Procure a tubular bottle of sufficient capacity to contain the necessary quantity of collodion for a day's work. Put a cork in the lower hole of the bottle, through which has been passed a small, curved glass tube. The latter must be a little longer than the bottle is high. See *fig.* 1 (side view), and *fig.* 2 (front view). The bottle is now filled with collodion and allowed to stand all night, in order that all dirt and foreign matter, with

FIG. 1. FIG. 2. FIG. 3.



undissolved cotton, may fall to the bottom. A cork is naturally placed in the neck of the bottle, and another small one in the top of the glass tube, to prevent evaporation. (I must here warn my readers never to employ vulcanised india-rubber corks, tubes, &c., when collodion is in question; for a certain quantity of sulphur will be dissolved, and the nitrate of silver bath will become contaminated.) The next morning the collodion is fit for work. It is extracted from the bottle in the following manner:—The cork is withdrawn from the neck of the bottle, and then the small one from the top of the tube; the latter is then lowered (see *fig.* 3) and the collodion flows out and is received on the side of the neck of the collodionising bottle. This will prevent air-bubbles. When poured upon the plate the excess of collodion must be received into another bottle and set apart until the evening, when the necessary quantity of ether and alcohol of which it has been deprived by evaporation is added, together with some new collodion to replace that employed during the day. This is added to what remains in the decanting bottle, and the next morning it is again fit for use. This system possesses the advantage of suppressing the glass tap, which sometimes sticks in a disagreeable manner or, what is perhaps worse, leaks.

Many formulæ have been suggested for the cleaning of old plates in order to employ them again either for portraiture or landscape photography. Among the many lately given to the public I see that the use of concentrated ammonia is advised. It appears to me that the smell of that chemical is anything but agreeable, and that a more easy or, at least, a less disagreeable means of cleaning old plates would be welcome to my readers. I therefore offer them the fruits of long experience, hoping, if perchance my system be known to the majority, it may, at least, prove useful to beginners:—

Dissolve a pound of American potash in two quarts of water; pour it into an earthenware dish or tray. Introduce each glass separately into the liquid, taking care to prevent air-bubbles. The plates are allowed to remain at least twenty-four hours in this solution; they are then taken out one by one, placed under a tap, and well scrubbed with a cocoa-nut-fibre brush until all the old collodion and varnish disappear. They are then plunged into another dish containing a solution of three per cent. of hydrochloric acid, well washed under a tap, and wiped dry with towels. On no account must they be left to dry spontaneously, or they will become stained. Before the plates are used they require to be cleaned with a solution of rotten-stone into which a few drops of ammonia have been introduced.

Our scientific world is in deep mourning, for a deplorable and fatal accident has happened to two of its bravest and most able pioneers. Last Thursday I witnessed the departure of a balloon called the "Zenith," in which three *savants*—MM. Crocé-Spinelli, Sivel, and Tissandier—took their respective places full of life, hope, and animation. Alas! the following morning the sad intelligence reached Paris that the two first-named gentlemen were no more—that they had fallen victims to their love of science. The balloon ascent was not an ordinary one, undertaken to please a staring crowd of people, or I would not have mentioned it to the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY. Not only had these gentlemen fixed ideas as to furthering aërial locomotion, but the experiments were undertaken with higher motives, the principal of which was to ascertain whether a balloon could be made to ascend or descend in the air at will without losing gas or throwing out ballast. The unfortunate M. Crocé-Spinelli, in order to effect this, proposed to paint one side or hemisphere of the balloon black, the other white; therefore, if the black side of the balloon were turned towards the sun, an absorption of caloric would take place, and, necessarily, an expansion of the gas, which would cause the balloon to rise. If the white side of the balloon were turned towards the sun the heat would be reflected, the gas become cooled, and the balloon would descend. If half white and half black were exposed to the sun's rays the balloon ought to remain stationary. By this means a balloon would become an instrument of precision, and scientific experiments would become not only possible, but easy, in mid-air. Instantaneous views could be taken of the surrounding country, which, indeed, is not new, for Nadar took, not long ago, the panorama of Paris from his balloon.

The ascent of the "Zenith" took place without any accident; it rose triumphantly into the air, and was soon out of sight. It appears that it rose rapidly to the height of 8,500 yards, when, the air becoming more and more rarified, the three *savants* fainted. M. Tissandier opened his eyes for a moment and saw his companion Crocé throw the aspirator overboard, which apparatus weighed at least 80 lbs. Now, what happened is known only to the Almighty; we can only suppose that the balloon being lightened of the weight of the aspirator rose high into the air; the sun shining brightly on the balloon at the same time, made it rise higher and higher, until it attained an altitude where it was impossible for human lungs to exercise their functions. Did M. Tissandier at this critical moment pull the safety cord and let out a little of the gas? did it escape by the opening below? or did the white side of the balloon turn towards the sun? These are questions impossible to answer; but what is known is that M. Tissandier opened his eyes and found himself at a height of 6,500 yards, with his two friends lying dead at his feet, their countenances as black as ink, and their mouths full of blood.

What a horrible situation! Three young and healthy men, united in their love for science and discovery, rose gaily into the air amid the applause of those invited to witness the departure of men brave enough to launch themselves into the immensity of space to struggle, as it were, against Nature's boundary; for here may be said "thus far shalt thou go, and no farther." An hour afterwards one of them, nearly suffocated, was obliged to descend with the disfigured corpses of his friends.

How many admirable projects—how many brilliant hopes have been dispersed by the unfortunate and violent deaths of those two hardy aërial navigators! For who will now have the courage to execute a new ascent? Who will now have the courage to brave the immensity of space? E. STEBBING, *Prof.*

3, *Place Bréda, Paris, April* 20, 1875.

## COLONEL WORTLEY AND CANON BEECHEY.

*To the* EDITORS.

GENTLEMEN,—The letters of Colonel Wortley and Canon Beechey in your number for March 19, lately received, oblige me very reluctantly

to return to the matter which they relate to, especially the very remarkable letter of Canon Beechey, in which, in his friend's behalf, he positively declares his unwillingness to be influenced by even the most decisive evidence. This letter, and my own desire not again to task your readers' patience, render it necessary that I should once for all put the proof of priority into a shape so clear that no independent person can in future entertain a doubt as to the facts.

Colonel Wortley is entirely right in saying that when he first began to use my process he made handsome and full acknowledgment. Had he continued to act in the spirit with which he commenced no unfriendly word could ever have passed between us. Before long, however, he began to ignore what had been done before his time. The formula which he permanently adopted was, in what both he and I consider the essential part, the proportion of silver, simply a reprint of the very first formula which I printed in April, 1870, when I first discovered how to make plates with excess of silver. And lately, forgetting apparently the relative dates of his publication and mine, he has begun to charge me with copying mine from his. Especially during the interval of my prolonged absence has this charge been reiterated. Not only have opportunities been availed of, but expressly created, so that even in the few publications that I receive I have noticed *five** such repetitions since early last summer, besides the many of older date, not doubting that there have been yet others which have not come under my notice. In each priority is claimed over me by Colonel Wortley, and in some I am charged with copying from himself. It seemed as if by this continued iteration (not noticed by any word from me) Colonel Wortley aimed to fix his claims so deeply in the public mind that they could not be eradicated.

To these five recent statements I have replied but once, and my one reply drew out two more. So that, in demands upon public attention, the account stands *seven* upon one side to *one* on the other. But this question of priority must be capable of very simple settlement, and that settlement I propose once for all to give here.

First: it will be proper to cite Colonel Wortley's claim, for which one of these seven more recent statements of it will suffice:—"I am gratified, on the other hand, to find Mr. Lea, after having, *till the publication of my paper in June,* 1871, constantly written down any excess of silver over ten grains as injurious, and that he saw no use in loading down the collodion with silver, now recommending twenty-five grains to the ounce," &c. * * * "He thus entirely admits the correctness of the views which I have long advocated," &c. By reference to this paper of June, 1871, it appears that the quantity of silver nitrate recommended by Colonel Wortley was *sixteen grains.*

*Fifteen months* before this paper of Colonel Wortley, viz., April 1, 1870, in a paper published in your columns, I recommended the use of *exactly Colonel Wortley's quantity—sixteen grains* (The British Journal of Photography, vol. xvii., page 144). *This was the first formula for the chloro-bromide process in its present form that I ever published.*

On April 29, 1870, I wrote:—"I have got much better results by increasing the proportion of silver to *eighteen grains.*" Again, on the same date:—"In a careful comparative trial with a collodion sensitised with *sixteen grains* and kept twenty-four hours, and one sensitised with *eighteen grains* and kept fifteen hours, it was judged that the latter was at least twice as sensitive as the former."—The British Journal of Photography, 1870, page 192.

These extracts will sufficiently show that over a year before Colonel Wortley began to write on the subject I had discovered and put in print the influence of large doses of silver nitrate *as completely as it is known today.* I use today almost exactly (indeed to a fraction of a grain) the quantities which I used in 1870. I continued during the whole interval to use a large proportion of silver, except during one period, when I employed a peculiar preservative which did best with a bare excess, and at that time I condemned the use of a larger quantity. If I returned to that preservative I should do the same again. Later I found other preservatives—first, pyrogallic acid, and then albumen, which did better with my earlier formulæ, and even with larger doses of silver. There is nothing in this which justifies Colonel Wortley in claiming as his discovery what was made out with the utmost clearness a year and more in advance of him, and was put into print again and again as clearly as language could express it. If an experimentalist at any time changes a formula, another who elects to prefer the older formula cannot therefore claim to have discovered it. Such an idea is absurd, and yet this is neither more nor less than Colonel Wortley's position. Yet, more: he has even published that he was blamed by a friend for not having the principle of "saturation" with silver nitrate by the use of sixteen grains, as published by him in June, 1871 (precisely the amount which I had advised in my paper of April, 1870), secured to him by letters patent! *Risum teneatis, amici?*

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There are but two motives which can impel a stranger to intrude upon a discussion such as this—the desire to act as peacemaker, or the wish to support a friend unable to sustain himself. Canon Beechey does not appear to have been actuated by the first of these. He feels, it appears, no compunction in using my process without acknowledgment; he prefers, as he says almost in as many words, to take it at second-hand from his friend Colonel Wortley. The little consideration which he feels for the rights of others appears sufficiently from a paper published by him at an earlier date in your columns. It is curiously characteristic of the fate which has befallen this process of mine that when Canon Beechey first went to work with it he re-described my principal manipulations, ascribing part of them to Colonel Wortley and giving the rest as original with himself. For, when a writer publishes detailed directions, if he do not expressly attribute them to the real author he makes them by implication appear as his own; every reader who does not know better necessarily accepts them as such. I never before cared to notice this lapse of Canon Beechey's, but lately chanced to read his communications of November 17th and 24th, 1871, and saw, with no little amusement, much of my detail of manipulation reproduced from my papers of the year previous (The British Journal of Photography, 1870, pp. 324 and 410). In these I had then first advised the solution of the silver nitrate in hot alcohol, the adding of it to the collodion whilst still hot, suggesting the use of a small flask as a convenient vessel. All this Canon Beechey reproduces in full detail, and, to illustrate the operation of dissolving by heat in alcohol, introduces a woodcut in which, by some blunder of the draughtsman, a flask is depicted in the act of falling off a lamp-stand (p. 542). Again: the necessity of giving these plates (then, for the first time, made with excess of silver nitrate) a very short washing only, I had not long before (The British Journal of Photography, 1871, p. 217) worked out with much labour—detecting in too much washing the source of occasional most perplexing failures. This important observation is by Canon Beechey expressly attributed to Colonel Wortley. These modes of procedure, that have now passed into such general use as to seem matters of course and common property, I had then newly discovered. The honours of the same, such as they might be, were, however, quietly divided by Canon Beechey between himself and his friend. The matter has its only importance in being illustrative.

If Canon Beechey be not original in his manipulations, in his chemical views he atones for the deficiency. The accelerating function of bodies like tannin he attributes to their power of starting a commencement of "oxidation" in the film. Usually the change in the sensitive film is supposed to be one of reduction. I do not see how Canon Beechey proposes to sustain his friend's cause by attacking cochineal as a preservative. It is certainly all and exactly what I have said of it. It requires some knowledge of chemistry to prepare it; Canon Beechey may not have been successful in the attempt. He asks—Did any body succeed with it? I answer, many; it was found good enough to be worth preparing commercially, as I conclude from having seen it advertised in your columns by an English manufacturer. These observations of Canon Beechey seem to be not altogether in good taste.

Canon Beechey assigns as his reason for ascribing the discovery of the usefulness of a large dose of silver to his friend that he himself "would not have taken up the process from anything that I had written about it." This seems a singular, indeed I may say an altogether new, criterion to establish. Unless a process be so fortunate as to attract Canon Beechey's favourable attention dates amount to nothing—the discoverer has no right of priority, but any roving experimentalist may claim it; and if, from *his* remarks, Canon Beechey is induced to "take it up," then the appropriator becomes the true discoverer! Truly these are new lights; we have but to accept them to open a vast field in the past for re-discovery. Whatever Canon Beechey has not "taken up," is at any man's disposal. This is no forced conclusion, but simply Canon Beechey's somewhat obscure but very significant expressions put into plain English. Somewhat illogical it may be as a matter of reasoning, but Canon Beechey had already signified his preference for using my work only at second-hand.

Now I find in looking back after an interval of five years that these descriptions were very clear and full, and that an unusually large number of photographers, strangers to me, wrote to the Journal of their success with them. In fact, as respects the mode of working emulsions (Mr. Bolton's ingenious process belongs to a different class), it does not appear that up to the beginning of the present year any valuable improvement has been made on these formulæ of 1870, except, indeed, in the preservatives.

Canon Beechey, in his recent letter, speaks of *aqua regia* "rotting the film." This statement, which appears to have originated with Colonel Wortley, is a mistake. It never received acceptance, and is now believed by no one. To Canon Beechey's assertion of it I shall simply oppose *his own contrary opinion* expressed in your columns (The British Journal of Photography, vol. xviii, page 542).

But what this, and cochineal, and the question of strong and weak developers, and other matters introduced by these gentlemen into their answers have to do with the single point at issue I cannot conceive. I have tried in vain to limit the discussion to the issue; could I have succeeded this letter might have been greatly abridged. I feel that in this matter I have the right on my side, and, except I let it go by default, the truth must be easily established. It remains only for me, in conclusion, to repeat emphatically what I said before—that sooner than be drawn into this controversy I would have let my priority stand

* The British Journal of Photography, 1874, p. 255, p. 345; 1875, p. 59. *Photographic News,* 1875, p. 58. The fifth reference I cannot at this moment readily find, nor is it worth the trouble of seeking out.

its chance for recognition, had I been spared the most unfounded charge of copying where I have been copied from.

"O imitatores, servum pecus, ut mihi sæpe
Bilem, sæpe jocum, vestri movere tumultus!"

—I am, yours, &c., M. Carey Lea.
*Philadelphia, April* 7, 1875.

[With the above letter this discussion must terminate.—Eds.]

## COPIES FROM TRACINGS.

*To the* Editors.

Gentlemen,—When in America, and being in the employment of the United States Engineers, I received a map 6 × 4 feet in size, from which to produce twelve copies by the aid of photography. Not having apparatus that would take a negative of those dimensions, I did not at first know how to manage it. A thought struck me that I could employ a tracing beneficially.

A tracing I procured, cut it into sections of convenient sizes, and printed from them my negatives on albumenised paper very deep. I omitted the toning and fixed with hypo. When dry I waxed them by placing them on hot plates and rubbing in, removing the superfluous wax with blotting-paper.

My next process was simply to print my positives on plain paper and mount them on canvas, bringing the sections in their right places.

This was an idea of my own, but practised, no doubt, by many.—I am, yours, &c., T. Clarke.
*Weymouth, April* 19, 1875.

## EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at the small cost of one shilling in our advertising pages. This column is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

A 12 × 7 mahogany pantascopic camera, complete, with clockwork movement and Grubb's patent D lens, is offered in exchange for a cabinet lens, in good order, by Ross or Dallmeyer.—Address, G. H. Murray, Woodbridge-road, Guildford.

I will exchange a twelve-inch square mahogany bellows camera, folding tail-board, brass-bound, as good as new, for a 10 × 8 or eight and a-half-inch, with repeating back. Pay difference if necessary.—Address, William Ferguson, photographer, Keswick.

About 500 numbers of The British Journal of Photography, 1865 to 1874, Robinson's *Pictorial Effect in Photography*, and the *Circle of the Sciences*, thirty-two numbers, cost two shillings each number, will be exchanged for a 12 × 10 portable camera, rolling-press, or anything useful in photography.—Address, "Lux," Post-office, Totnes.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

J. B.—Thanks for enclosures.

Dr. K.—Thanks for note. See article in present number.

J. H. T.—Use a soft wash-leather for cleaning the lenses; this is better than either silk or calico.

C. L. Pond (Buffalo, U.S A.)—P.O. order to hand, which balances your subscription to December 31, 1875.

G. Smith.—We are making inquiries, and will write as soon as we can ascertain the address of a suitable person.

Amicus.—In forming a concentrated solution of pyrogallic acid with which to charge the dropping bottle use *absolute* alcohol.

Boss.—Thanks for kind invitation, but its acceptance is at present inexpedient. The gentleman respecting whom you inquire is still alive and well.

Samuel Heather.—The solution of iodine need not be strong. Such a degree of strength as that indicated by its being of a pale sherry colour will answer quite well.

J. B. Payne.—In one of the sheets there are numerous miniature crystalline formations, which will, we believe, be prevented by the admixture of a small proportion of castor oil.

Operator.—Try the effect of rubbing the surface of the albumenised paper with a tuft of cotton. It is said that this, in many instances, obviates the tendency to run into drops.

E. S.—We know nothing of the new process beyond what has been published in the article from which you give the extracts. See an article on the subject in the present number.

Liscard.—1. We are unable from personal experience to give the best proportions of alum to be added to the silver bath for durable sensitive paper. —2. Let the bath be made of ebonite or thin glass.

Collodion.—Seeing that you fail in making such a collodion as you desire, would it not be well for you to purchase some? There is so much good collodion accessible that it would be indeed difficult to purchase a bad sample.

Wolstenholme Brothers.—The *cartes* are excellent examples of good lighting and manipulation. We observe that you use the hot burnisher with good effect. A less pronounced tint in the albumenised paper would, however, enhance the beauty of the pictures.

A. C.—A quarter of an hour is too long a time for the prints to be immersed in the fixing solution. If the hyposulphite of soda be of the proper degree of strength—and it should never be used weak—five minutes will prove sufficiently long to ensure perfect fixing.

Provincial.—After bestowing much consideration upon the case we conclude that B. has sinned purely through ignorance, and as he has made all the amends in his power the matter ought to be allowed to drop. Seeing you have sustained no loss it would be an ungenerous act to give publicity to his apology.

L. G.—The piece of paper reached us in a very discoloured state. There is an apparent decomposition of the albumen. We can suggest no remedy save the modifying of your silver bath, rendering it either alkaline, acid, or neutral as the case may be, and trying also the effect of fuming with ammonia.

Geo. Harvey.—There is certainly a defect in the picture, and a very serious defect too; but this does not indicate any fault in the lens, which appears to be an excellent instrument. The distortion is caused by your having tilted up the camera when taking the building. This is a case in which a swing-back is a necessity.

G. Smith.—The patentee sold his rights several years ago; hence it is impossible for him to acquiesce in your request. You might apply to the proprietor of the patent; but you may save yourself the trouble, for we know that he has expressed his intention of allowing no one to share with him the pleasure or emoluments arising from working the process.

P. P. J.—Having divided the camera into four equal parts, screw upon the front, by a single hole in the centre, a large, circular brass plate, near the margin of which is an aperture into which the lens is screwed. The distance of the lens from the centre must be such as to coincide with the centre of each compartment. By rotating the plate the lens is thus brought opposite to each quarter of the plate in turn.

J. C. (Edinburgh).—To intensify negatives with bichloride of mercury make a saturated solution of this salt in hydrochloric acid, and dilute with six or eight times its volume of water. When this is poured over a collodion negative it becomes much darker at first, but afterwards assumes a bleached appearance. At any stage apply, after a thorough washing, a weak solution of hyposulphite of soda, cyanide of potassium, ammonia, or, best of all, sulphide of ammonium. Again wash and varnish.

E. B. H.—This correspondent desires to say that he has had an india-rubber bath in daily use for six and a-half years, and during that time he has not had a single bad negative the imperfection of which was in any way traceable to the material of which the bath was composed. Strictly speaking, the bath (a dipping one) is made of wood, but it is thickly lined with pure rubber. He makes this statement believing that it may reassure some who have recently been inquiring concerning the probable effect of india-rubber on the negative bath.

G. P. P.—The alcohol may have its strength greatly increased by either of the following methods:—Tie it up in a bladder and suspend it in a warm place. The water permeates the bladder and leaves the alcohol in a state of concentration. A quicker mode is to place the alcohol in a bottle and shake up with it a small quantity—say a dessert spoonful to the pint—of very dry pulverised carbonate of potash. Shake it well, and at frequent intervals, during a quarter of an hour, and then allow it to repose. Most of the water will then be seen at the bottom of the bottle united with the carbonate.

H. H. (Yorks).—To obtain the intensity in large negatives that you do in small ones a proportionately longer exposure must be given. Yours appears to be a case in which the use of mercurial intensification (see answer to "J. C.," in present number) would be beneficial. Try first the following:—After fixing and washing apply a three-grain solution of pyrogallic acid containing two grains of citric acid to the ounce; and to this add, in the proportion of from twelve to twenty drops to the ounce, a thirty-grain solution of nitrate of silver—not bath solution. This will probably give more intensity than you desire; if so, reduce the proportion of silver.

Received.—W. Harding Warner.

## METEOROLOGICAL REPORT,

*For the Week ending April* 21, 1875.

Observations taken at 406, Strand, by J. H. Steward, Optician.

These Observations are Taken at 8.30 A.M.

| April. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 15 | 30·38 | E | 38 | 40 | 52 | 37 | Foggy |
| 16 | 30·38 | SE | 40 | 43 | 52 | 39 | Dull |
| 17 | 30·26 | SE | 40 | 42 | 62 | 39 | Foggy |
| 19 | 30·13 | E | 43 | 47 | 70 | 42 | Dull |
| 20 | 30·18 | E | 44 | 46 | 72 | 42 | Dull |
| 21 | 29·89 | S | 49 | 53 | — | 45 | Dull |

CONTENTS.

THE BRITISH

# JOURNAL OF PHOTOGRAPHY.

No. 782. Vol. XXII.—APRIL 30, 1875.

## THE REPRODUCTION OF ENGRAVINGS.

Some little time ago we undertook to reproduce for a friend a number of engravings, many of them of great age, whilst others were of comparatively recent date, thus exhibiting very many different phases of difficulty. The manner in which we combated and surmounted the various troubles may, we think, prove interesting to our readers.

There is probably no branch of photography which offers greater promise of pleasure and instruction than does the one in question; yet how few amateurs ever think it worth while to devote either time or attention to it! Certainly there are shoals of reproductions of this nature in the market; but very few are worth anything either as pictures or photographs, owing, doubtless, to the fact that the majority of recent pictures are protected by copyright, while prints of the old masters are rarely available. The Copyright Act so clips the wings of this branch of photography as to render it useless, from a pecuniary point of view, to embark either skill or capital in it; still we think that amateurs might, without in any way infringing the law or getting into trouble, find plenty of work in this direction, and would not, we believe, regret the results obtained.

The difficulties usually experienced are of two kinds—namely, those connected with the mechanical arrangements employed, and those of a chemical character, the former including distortion arising from want of parallelism between the sensitive plate and the object to be copied, and curvature of the marginal lines owing to the use of an unsuitable objective. The avoidance of these evils is too obvious to necessitate on our part any further remark, and we will, therefore, proceed to discuss the remaining part of the question.

The principal difficulty of a chemical nature lies in the production of a dense, vigorous picture, perfectly opaque in the lights while the lines are represented by clear glass, each of the minutest markings standing clearly distinct and not shaded into the next. This defect is chiefly found in those parts of the engraving in which the more delicate shadows are made up of lines of great fineness—when, in fact, the capabilities of both lens and chemicals are tested to the utmost. But it is not to the lens we must look for an improvement; for with the perfect instruments obtained nowadays almost microscopic definition can be secured with ease. Nor is it altogether to be blamed upon the chemicals, though as a matter of necessity these should be in the best condition if the highest quality of result be required. The defect is rather traceable to a species of blurring or irradiation within the film, and the utmost precaution should be taken to guard against such a tendency. Again: it will be remembered that the lines of an engraving are formed, not of a homogeneous mass of colour, but, if examined under the microscope, exhibit a rough, irregular appearance, made up of separate particles in greater or less proximity according to the thickness or density of the film of ink. In the finer lines, where the ink is necessarily very lightly applied, the particles are few and far between, the effect of a lighter shade of grey being given by the reflection of white light through the thin film of ink. Hence we see that the bolder portions of the picture reflect a much less quantity of light than the finer lines, which are thus robbed of their proportionate value when photographed. Besides these troubles we have another, which is frequently, and especially in old engravings, the most difficult to contend with. We allude to the texture of the paper upon which the picture is printed, which is reproduced as faithfully in black and white as are the lines forming the print, unless special precautions be taken to avoid it. Much may be done by a proper adjustment of the light both as to direction and quality. A cross or side light brings out with greater prominence the irregularities of surface, while direct sunlight, or even powerful diffused light, possesses a similar tendency.

We have tried various processes, both wet and dry, each having its advantages under peculiar circumstances. The ordinary wet process is, perhaps, the most easy to manage when a fair exposure can be given; that is to say, when an abnormally long or short exposure is not necessary to overcome some textural difficulty. Under the latter circumstances we prefer one of the numerous dry processes now in vogue. The common honey process of years ago gave in our hands negatives of a highly satisfactory character, but required a long exposure. The tannin, coffee, and albumen preservatives gave plates which, developed by the alkaline or acid silver method as circumstances required, left little to be desired, the latter form of development rendering the lines perfectly clear with complete opacity in the lights. For such cases as required special care in hiding the texture or discoloured nature of the paper, we found the most satisfactory results were obtained with dry emulsion plates. These will bear a very great range of exposure, which is of importance when there are textural markings to avoid. We have on more than one occasion found it necessary to take a thin negative on a bromide plate, to be afterwards reproduced by means of a transparency. By this means the most hopeless-looking subjects may be mastered.

The emulsion we used contained in each ounce six grains of pyroxyline, and bromides sufficient to require twelve grains of silver nitrate for combination, eleven and a-half being the quantity actually used. After sensitising, four grains of aurine in solution were added to prevent internal radiation. The preservative consisted of a plain solution of tannin, twelve grains to the ounce. Long exposures were given in all cases, and free use was made of the potassium bromide in the developer to keep the lines clear. In one case an extremely long exposure had to be given, in order to destroy the texture, and upon development the plate refused entirely to acquire any density. It was washed, treated with dilute nitric acid, and, after reorganifying and developing, resulted in a transparency, which, in turn, produced a negative bright, clear, and dense, without the least trace of texture.

We found great use in a solution of iodine or, better still, a mixture of bromine and iodine, of about the colour of brown sherry. If any veiling was observed to take place during development an application of the bromine mixture, followed by weak hypo., completely removed it. Its use is unattended by any risk, as there are no half-tones to be destroyed, the only precaution necessary being the application of the mixture equally to every part of the plate; this is best done in a dish. We should here remark that we much prefer redevelopment *after* fixing.

A method which proved of great use to us in the case of some small pictures was to dispense with the camera altogether and print them by superposition upon dry plates in an ordinary printing-frame.

We do not introduce this as a novelty; but we were much surprised at the perfection of the negatives obtainable in this manner and the saving of trouble. For reproductions on the scale of the original we shall never wish to employ any other method. Though the engravings copied were on thick plate paper, some of them being old and much discoloured, we had not any difficulty in avoiding the imitation of texture, about fifteen to thirty seconds' exposure being given in good diffused light; but *sunlight*, however brief the exposure, appeared to penetrate the black lines at once.

A simple contrivance which we found of great use, and which may easily be "rigged up" by any amateur mechanic, was a board upon which to fix the print to be copied. This was fixed in a position perfectly square with the camera, and was provided with sliding motion in a horizontal as well as vertical direction, similar to the double sliding fronts of our modern landscape cameras. By means of two lines from corner to corner the picture was easily fixed approximately, and by using the sliding motion might be centered almost instantaneously.

We should be glad to see more amateurs entering the field in this direction. Surely there is an abundance of works of art available for the purpose; and what can be more pleasing than a well-executed copy of a steel or copperplate engraving?

## NOTES ON THE BEER AND ALBUMEN PRESERVATIVE.

Although, as mentioned in a former article, we believe the time is not far distant when an emulsion process, probabl a modification and combination of the various methods recently introduced, will be generally adopted by most amateur landscape workers, we are not unmindful that there is a considerable number of what may be called our "non-experimental" brethren who will, until the new aspirant for public favour has fully established its popularity, be content to work on in the old groove, caring for nothing but good pictures, and getting them too, as may be done with almost any process already recommended if only patience and perseverance be duly exercised.

It is a well-known fact that a solution of well-nigh any organic matter may be successfully used as a preserver, and it is equally well recognised that nearly every article of daily consumption has been tried, and by somebody found to give fair results. Of the great mass of such organifiers it may be said that they were almost strangled at their birth; but a few of them—partly, perhaps, on account of the greater perseverance of their originators, and partly because of their greater suitableness for the purpose proposed—took a somewhat firmer hold of the public mind, and a few of them continue, and are likely for some time to continue, to meet with much favour.

Of the latter class is the now familiar "beer and albumen" process, originally introduced by Mr. W. H. Davies, and at present largely and successfully used in various parts of the country, especially north of the Tweed. For the beer and albumen process many confess to have a partiality. It is simple, certain, and the resulting negatives are generally of the highest quality. The material is so cheap that a bath may be filled and the plate immersed without trouble. From a dozen plates we always feel certain, *cæteris paribus*, of getting a dozen good negatives; and the colour of the deposit is such that, although the highest lights may be delicately transparent, the negative yields prints quite equal to any that can be got by wet collodion. Although, however, the process is thus certain in our hands, and in those of many of its admirers, we know from the reports of meetings of some photographic societies, and from many letters we have received on the subject, that difficulties and failures are not infrequent. With a view to ascertain the cause of the complaints which have arisen we have just finished a series of experiments, and now propose to make a note of the results, and also recommend a slight modification which, we believe, will be found thoroughly satisfactory.

We had no doubt at the outset that the cause of insensitiveness and occasional failure lay in the beer, which, although an article of nearly universal consumption, is, nevertheless, one of very uncertain composition. It is well known that the brewer cannot successfully carry on his operations unless he have a supply of suitable water, and what constitutes *suitability* in his case is, unfortunately, very much the reverse as regards photography. Freedom from organic matter is an essential requisite for both purposes; but the presence of a certain or, in most cases, uncertain quantity of saline material, while injurious in a photographic sense, is supposed to be absolutely necessary for the production of the higher classes of beer. Then the process of fermentation is by no means thoroughly understood or uniformly carried on. In the yeast used there is a constant tendency to deterioration, for the cure of which the brewer has frequently to exchange with his neighbours, and those only who have been permitted to see behind the scenes know the trials and troubles of a diseased "tun room," when "foxy" fermentation and many other ills which beer at this stage of its manufacture is heir to make their appearance. Nor is this all. The natural and what, we presume, we must call necessary impurities are in many cases very materially increased by the addition of considerable quantities of chloride of sodium (common salt), for a purpose best known to the adulterators. Now it is a recognised fact that chlorides are, under certain circumstances, destructive of sensitiveness, and hence, we have no doubt, have arisen the difficulties in the practice of the beer and albumen process.

Of fifteen samples of beer obtained from as many different breweries only two were free, or almost free, from chlorides; four were very nearly as good, but contained a larger quantity of carbonates; while the rest yielded the salt in such quantities as left no doubt of its having been purposely added. With a view to decompose this injurious chloride of sodium Mr. Davies, some years ago, recommended the addition of a small quantity of nitrate of silver, which, undoubtedly, shortens the exposure very much, and would be altogether unobjectionable if we could always calculate the quantity of chloride present in the beer. This, unfortunately, the ordinary amateur is not always able to do, and therefore a degree of uncertainty is inevitable. To obviate this objectionable feature we have had recourse to the infusion of malt suggested for use in this process by the "Peripatetic Photographer" in his last *Notes*, and find that it possesses all the good qualities of the beer without any of its objectionable features. Crushed malt is easily obtained, and will keep good for a long period. All that is required is to put four ounces of it into a jug or jar, cover it with twenty ounces of water at a temperature of 170° Fah., and let it stand till cold. To this, after filtering, is to be added the albumen of two eggs and twenty grains of pyrogallic acid, when the preservative is ready for use.

Plates prepared with this, and exposed under pretty strong sunlight with a stop of $\frac{f}{20}$, give capital negatives with from three to five minutes' exposure, the development being started with alkaline pyrogallic acid. The plates are easily intensified with acid pyro. and silver. No restraining bromide is required; in fact, fogging by this method of working seems quite unknown.

While many will think a plate which gives a good landscape with an exposure of from three to five minutes quite rapid enough for all ordinary purposes, we are glad to be able to assure those who hunger and thirst after greater sensitiveness that if they will try the method of fuming recommended by Mr. Davies last year they will be able to make good work in a third of that time. From the result of our experiments in this direction we find that if the plates are fumed with ammonia, precisely according to the well-known method of fuming paper, a sensitiveness very nearly equal to wet collodion will be attained. It must, however, be kept in mind that the plates must not be used for at least five hours after fuming, and that the accelerating effect of the ammonia seems to be lost after the expiration of four or five days; but it is at once restored by refuming.

To sum up the matter in a single sentence: we would strongly recommend those who desire to work in the good old path with simplicity, certainty, and with the best results, to give the malt and albumen process a trial, and where very rapid work is required they will find the fuming with ammonia a decided advantage.

## METROPOLITAN PHOTOGRAPHIC INDUSTRIES.

### THE LIVERPOOL DRY-PLATE COMPANY.

The Liverpool dry process—as the collodio-bromide emulsion process of Messrs. Sayce and Bolton has been universally termed—had scarcely been introduced till the more thoughtful of our brethren of the camera immediately perceived that it was destined to become *the* process of the future. What though the results were at first imperfect, leading the smaller-brained among our fraternity—those who, somehow or other, cannot see that all things, including man himself, must have a starting-point, and must pass through rudimentary stages; what though these wise folks, having put this photographic "bairn," while yet *in statu pupillari*, into juxtaposition with other old, tried, and well-worn processes, failed to realise in the juvenescent stripling the promise of the young giant it was in reality; yet the more thoughtful, as we have said, immediately recognised the outcome of a principle, the ushering in of a process, that from its inherent beauty and soundness of principle was necessarily certain to effect a revolution. Instead of the baths, slops, and washings previously considered necessary adjuncts to the preparation of a sensitive plate, there was now seen such a simplification as arose from the mixing together of the sensitive material with the collodion and applying both simultaneously by the one act of pouring from a bottle. To what a degree of perfection this system has now been carried will be seen by and by as we proceed. For a considerable period the Liverpool process was mainly confined to the amateurs of Liverpool—for the most part to the members of the Liverpool Amateur Photographic Association — although, as our columns bear witness, it was being occasionally tested experimentally elsewhere. It was first introduced, although only to a few local amateurs, in 1864, and was given to the world through the Association above mentioned in 1865.

Among the amateurs who went heart and soul into the then callow process was Mr. Peter Mawdsley, whose success was so marked that he was induced by his friends to supply them with plates of his own preparation, and this in turn led to the formation, early in the year 1867, of what is now so familiarly recognised as the Liverpool Dry Plate Company—the productions emanating from which Company are well known and justly famed all over the world. Previous to the formation of the Liverpool Dry Plate Company only one other establishment existed solely for the preparation of dry plates, the one alluded to being that originally established in connection with the dry-plate process of Dr. Hill Norris, whose method of preparing plates, it will be remembered, was by sensitising in a bath, washing thoroughly, and then immersing in a warm solution of gelatine or some similar body. In the course of time the Liverpool factory, which had been established at Seaforth—a suburban village proximate to the great northern seaport—became so prosperous as to render desirable its removal to London as a more suitable centre, and to London it was accordingly transferred at the beginning of last year.

Availing ourselves of an invitation to inspect the new factory, which is conveniently situated within two minutes' walk of Clapham Junction, we spent a considerable portion of a day in trying and seeing tried various experiments with dried plates prepared, exposed, and developed under the most varied circumstances. It will be in the recollection of our readers how, about three months since, we reviewed in terms of the highest commendation a number of pictures taken by Mr. Stillman during a recent tour in the United States of America on plates prepared with an emulsion of a particular kind, of which we shall speak more fully hereafter. One of the experiments tried on the occasion of our visit was the exposure and development of some of the plates prepared by Mr. Stillman twelve months before for the purpose of taking with him to America, but which he rejected on account of some alleged defect in the substratum. Much surprised, indeed, were we to observe the great latitude allowable in the exposure, for some of them, exposed simultaneously in a binocular camera, received precisely twice the exposure given to others; and although from the fact of the two negatives being taken on one plate only one mode of development could be employed, and not a special developer for each end to suit greater or lesser exposure, yet was there singularly little difference in the finished negatives. We may here, perhaps, be permitted to digress for a moment to express our sense of the enormous amount of labour incurred by Mr. Stillman in his efforts to simplify emulsion photography. It is now about three years since, at the house of this gentleman, we saw his first experiment in washing and redissolving bromide emulsions. These experiments were unsuccessful for want of a proper pyroxyline; and, to show the influence of this body, we are in a position to state that, using the very same method as that by which he previously failed to succeed to his satisfaction, he now with a proper pyroxyline succeeds perfectly. Let no one imagine that there is in this the slightest intention of withholding from Mr. W. B. Bolton any of the great credit for having worked out to such a successful issue his washed emulsion process, for these experimentalists had been working in parallel directions unknown to each other.

In Mr. Mawdsley's laboratory we saw numerous large bottles of emulsion in various stages of ripening, and each possessing a peculiar character different from its fellow. The influence exercised by the quality of the pyroxyline is very wonderful, and makes all the difference between success and failure—between plates that are sensitive and slow—between thinness and density, flatness and intensity. Hence a constant system of experimenting is periodically going on so as to ensure in the working emulsion with which the commercial plates are to be prepared, or which is to be sent into the market, those special features that are required; and in this constant trying of results by actual experiment the public reap the benefit in productions possessing the greatest possible uniformity. To see, as we did, the preparation of the plates by the sensitive emulsion, and the rapidity and certainty with which it may be done when once the experimentalist becomes expert, was most interesting. A pile of plates, each with the face to be coated lowermost, is placed before the operator, who, by means of a pneumatic holder, lifts the uppermost, and from a wide-mouthed bottle of emulsion held in the right hand coats the surface and transfers it to an adjoining shelf to set, continuing this operation until the whole pile is coated, which is done with a degree of deftness only resulting from long practice. Each plate is then lifted up from the shelf or rack and is transferred to the drying oven, subjected almost in this act of transference to a few dexterous whisks on the back by means of a large paint-brush, charged with red colouring matter, and by which operation the plate receives its non-actinic backing. Having all been arranged round the interior of the drying oven, made of iron, the plates standing upon porcelain slabs, the door is closed, and in less than five minutes reopened to permit of the removal of the plates, which are now perfectly dry, both front and back being desiccated, and ready for packing in their opaque wrappers. This, as we have described it, was the whole operation as we saw it performed. As we brought away with us some of the plates forming the subject of that demonstration, and as we have since exposed and developed them, we can attest in the strongest manner the efficiency of the method of preparation.

But we must pause here for a moment to say a few words respecting the backing of these plates. It is by no means a difficult operation to the preparer of the plate to apply the red backing; but it is a most serious nuisance to the person by whom the plate has to be developed. Is there, we ask, any necessity for this backing when a moderately creamy film, such as that given by the Liverpool emulsion, is used? We think not. There may be exceptional cases, such as in photographing cathedral windows from the interior, when anti-halatives are not only desirable but necessary, and this no matter whether a wet or a dry process be employed; but for general landscape work we believe backing to be unnecessary. This is, if we are not mistaken, the opinion of Mr. Stillman; it is certainly that of Mr. Mawdsley. Mr. Woodbury, who called upon us a few days back, left with us some fine negatives taken by him with the Liverpool emulsion at Dartmouth, the subjects being some in which the strongest contrasts of light and shade are placed in juxtaposition without the slightest indication of blurring, no backing having been used. We have with the same emulsion tried experiments expressly for the purpose of discovering the necessity for backing, and quite confirm Mr. Woodbury's assertion that it is unnecessary, and should be omitted in ordinary work.

The operation here described has reference solely to the preparation of a plate by the commercial emulsion, and not to that of the plates sent out in a prepared state. The latter are still prepared by the method hitherto in use, and which, as we saw it conducted, is as follows:—A plate held on a pneumatic plate-holder was coated by Mr. Mawdsley from a bottle having a rather narrow neck, the surplus emulsion being drained off into a second bottle having a wide neck kept exclusively for this purpose; that is, the emulsion drainings are not used again for coating until they have all undergone filtration. A girl now receives the plate, places it on a dipper, and immerses it in three separate water baths placed side by side. After removal from the third bath a second girl receives it, washes it further under

a tap, transfers it to a bath of distilled water, and from that again to a second distilled water bath, following up this treatment by immersing it in the preservative solution. It is then drained and placed in the drying oven, and after being dried it is removed, coated with the red backing, and once more dried. The necessity for backing is greater in the case of these plates than in the others, owing to the preservative coating giving greater transparency to the film.

Among the experiments tried by Messrs. Stillman and Mawdsley when we were present were some to ascertain the value of staining the film. The result may be summed up in a few words: it rendered the plates very much slower than they were, and conferred no compensating advantage.

The principle of regulating the strength of the developer to suit the exposure has always been adopted by the manager of the Liverpool Dry-Plate Company. While a three-grain pyrogallic solution is recognised as that which is always best to adopt, circumstances have arisen in which, from under-exposure, a developer as strong as twelve grains has been employed, the ammonia and bromide, especially the latter, being increased in like proportion.

India-rubber as a substratum is much preferred to albumen, which for the Liverpool emulsion Mr. Mawdsley finds not to answer satisfactorily. The way he prefers to apply the substratum is to give the plate an edging of a benzole solution of rubber by means of a brush. This is found to answer every purpose.

It will readily be conceived that between supplying emulsion and coating plates a very large quantity of collodion emulsion may be consumed in a day. It is, however, considered a heavy day's work when half-a-gallon of emulsion is used for coating plates. In this quantity there are what is termed four batches, each batch coating from seven to eight dozen $8\frac{1}{2} \times 6\frac{1}{2}$ plates. To form quarter plates one of the above size is cut into four equal portions, and the method is generally adopted of forming all plates of small size by cutting down larger ones, the facilities for doing so with rapidity and precision being of an appropriate description.

We conclude by describing the most approved method of developing the plates prepared by the Liverpool Dry-Plate Company's emulsion:—The plate is wetted with ordinary alcohol and then washed under the tap. A solution of pyrogallic acid of the strength of from three to five grains is poured over the film and allowed to act for about a minute or more. By this time the image will have appeared, allowing the exposure to be judged of with tolerable accuracy. If this has been correct two minims of a ten-grain solution of bromide of potassium are added, and the whole flooded over the plate two or three times; after which are added, by one or two drops at a time, a solution of ammonia of the strength of a drachm to the ounce. When the details are all out equal parts of the solutions of bromide and ammonia are added to the developer until sufficient density is obtained. Should there be no sign of an image after the first application of the pyrogallic acid, instead of adding the first dose of bromide alone a drop of the ammonia solution is mixed with it, and the proportion of the bromide in the subsequent application diminished.

While at Mr. Mawdsley's we saw an American camera and changing-box, in the construction of which the workmanship and ingenuity displayed were of a very high character. The aperture in the changing-box opened and closed by the action of the slide. The dark slide itself differed essentially from any we had previously seen. The adjustments of the camera were also different from those in use in this country. The whole was finished in the most elaborate manner, the brass work being highly polished and coated with nickel. The Scovill Manufacturing Company, by whom it was made, are entitled to much credit for the excellence of the workmanship displayed in this elegant apparatus. We must confess, however, our preference for ordinary brass unprotected by nickel, by which a meretricious effect seems to be imparted. This, however, is a mere matter of taste.

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It has been suggested that, in view of the uncertainty which appears to prevail in the minds of some as respects the precise nature of the crystals by which pinholes in the negative nitrate of silver bath are produced, it would be desirable to point out some easy method by which minute crystals of oxalate of silver might be distinguished from iodo-nitrate of silver. We observe, in the first place, that the source of these two formations is different. The latter salt has its origin in the silver solution, while the former originates in the collodion, oxalic acid being among the products of the decomposition of soluble cotton. Let us suppose that some of the crystals which are believed to be oxalate of silver have been obtained, and that it is desirable that their nature should be ascertained without doubt. Wash a few of the crystals, and, after drying, place them in a small test tube. Now apply heat by means of a spirit lamp, and if the crystals be the oxalate they will behave in much the same manner as if they were gunpowder, detonating with a slight degree of violence. The presence of oxalic acid being thus indicated, it may be confirmed by adding to a few of the crystals pulverised and placed in a watch glass a few drops of water and one drop of sulphide of ammonium, when, after standing a short time, black sulphide of silver is produced, oxalate of ammonium remaining in the liquid. If this liquid, after filtration, be boiled, with the addition of a drop or two of dilute acetic acid, and a solution of sulphate of lime be added, a white precipitate is formed, which is soluble in nitric, but insoluble in acetic, acid, thus proving the presence of oxalic acid.

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## HOW TO TAKE LANDSCAPES WITH PORTRAIT LENSES AT FULL APERTURE.

In your issue of April 16 Mr. Herbert B. Berkeley appears to have been sorely troubled by divers and sundry critics on my method of flattening the field of a photographic camera, and thereby acquiring a power of using a much larger aperture to the objective, consistently with good definition over the whole field, than would have been possible otherwise.

I had not seen any of the criticisms alluded to, nor, simply as such, might I have found myself under any necessity for answering them; but when one of your correspondents asks for information I do feel both a necessity for, and pleasure in, doing what I can to satisfy him, though to accomplish that in this case will require me to repeat not a little of what I wrote in your last year's Almanac, as well as to add certain further detail.

Now the method inquired about is empiric only, and is introduced just at the end of the usual optical chapter, or at the moment before the various rays which have already passed through the best objective of the day come up to their several focal points; and the method is introduced there to correct a *residual* imperfection or difficulty which is found to exist more or less in every known lens. The difficulty is that no camera objective can be made to work with a large aperture (and, therefore, quickly), and at the same time give sharp focus free from astigmation over a large angular range of subject except on a field curved spherically and concave to the lens, while a photographer wants a flat field, and finds that on such a field the spherical picture, if sharply focussed in the centre, is dreadfully blurred at the margins. Also, no lens has yet been invented equal to the ordinary portrait lens for giving sharp definition with large aperture, and even at considerable angles to the optical axis, though always with the drawback that, if the focus can ever be said to be sharp everywhere all over the field, that field is the inside of a sphere, and not the surface of a flat plate; all points of the landscape view, moreover, being, at the same time, purposely chosen as either equally distant from the lens or nearly so.

If anyone doubt the above being a correct representation of the available optics of photography in the year 1875 I beg to refer him to Mr. J. Traill Taylor, who has written more abundantly and convincingly on the subject than all other men. But if any person does not doubt it, and has already convinced himself of its truth, let him come to me and hear how nine-tenths at least of the blurring near the edge of the field of a portrait lens with large aperture may be practically corrected without decreasing that large aperture and without any sensible loss of brilliancy of the light or rapidity of photographic action.

The picture, as a matter of course, once focussed at the centre is sharp there on the ground-glass plane, because the converging rays come there to a point; but it is blurred at the borders, because there the rays come to their crossing points *before* they arrive at the ground glass, and have diverged again. We require, therefore, that the focal lengths of all eccentric pencils of light shall be made in some way longer and longer in proportion to their angular distance from the centre.

Let us begin with a pencil quite at one side of the field, and, therefore, utterly blurred when the centre is in good focus, as well as visibly wanting, on that account, a good deal of lengthening. Inside the camera, and at right angles across the path of such eccentric pencil, and just a little before its converging rays come to a focus, introduce a piece of plate glass. The converging rays, on entering that plate, become *less* convergent; and, though they take up again

their former degree of convergence after having passed through the glass plate, yet, because while passing through it they had a less angle of convergence, the focal point will be now at a greater distance from the objective than before. In fact, by making the side pencil of rays pass through a sufficient thickness of glass plates, you may so lengthen out its focal distance as to cause it to form its focal point sharply on the very border of the flat focussing-screen, simultaneously with the central ray being equally in focus on the centre of that same screen without having passed through any other medium than air.

This radical feature of the principle involved anyone can try for himself, and be assured of its power; while the application of the principle to all the varying rays of the whole field of view simultaneously, results in having a plano-concave lens, as large as the greyed glass focussing plane, set with its concave surface towards the objective, and at such a distance therefrom as to meet its converging pencils of light a little distance—say one-quarter of an inch—before they come up to their respective focal points. The radius of concavity of such plano-concave correcting lens must evidently be a function of the radius of the spherical surface on which the objective forms its picture sharply. Let the latter, therefore, be found by practical trial, and the required radius of the concave can be easily computed therefrom.

When such radius of sphericity of the objective's picture is, according to the success of the optician who made it, three times that objective's focal length, then the radius of the plano-concave corrector, made in ordinary plate glass, should be equal to the focal length of the objective; and if the plano-concave be made of such exquisitely white plate glass, and with the perfection of workmanship exhibited in several specimens recently prepared for me by MM. Gasc and Charconnet, 10, Rue de Malte, Paris (see their advertisement in the ALMANAC), then the action of such plano-concave is almost magical in instantly giving to the whole field of view, however large the aperture of the objective at the moment, the sharpness usually seen only in the centre when the focus is adjusted for that centre alone. There are, moreover, no other practical drawbacks that I have been able to discover under microscopical examination of the pictures produced, whether employing dry plates or wet plates standing in a fluid bath having such plano-concave lens for its front window.

But if the radius of sphericity of the picture formed by any objective be, as it too frequently is, much shorter than what is alluded to above, the radius of curvature of the concave corrector will also have to be much shorter than before—that is, than the objective's focal length. Then will come the inconvenience of "pincushion" distortion in the boundary lines of the picture, unless, indeed, the objective should have been produced by its maker with an extra amount of "barrel" distortion to begin with.

Hence I warn everyone, as well as Mr. Berkeley, that my plano-concave corrector has limits to its useful applications depending on the radius of the spherical surface on which each objective's focal picture is formed *as compared with its focal length*. Also that it has no power whatever in "deepening the focus," as that term is usually understood, viz., rendering the focus for near and distant objects simultaneously indistinguishable, for that can only be accomplished by darkening the field with a small aperture. And, again: everyone can see for himself that, if the plano-concave corrector must have as large an area as the focussing greyed-glass plane of the camera, there are limits in size.

The method, in fact, can do nothing for the rich man working with colossal apparatus; but on a poor man, with short-focus lenses and small plates, focussing always with micrometrical accuracy, and intending afterwards to magnify in the copying camera, the method confers a remarkable power of combining the quickness of proportionally-large apertures with good definition over a tolerably-wide angular range. In such case why should *not* landscapes be taken with extra-rapid portrait lenses? It is, at all events, what I now find it quite possible to do.

C. PIAZZI SMYTH,
*Astronomer-Royal for Scotland.*

## THE WOODBURY PROCESS.

[A communication to the West Riding of Yorkshire Photographic Society.]

THE process I am about to describe is one which it is my firm conviction is destined to play a most important part in the future of photography. As a discovery it will rank in importance next to that of the collodion process, and will link the name of Woodbury with those of our greatest discoverers. In printing operations it will ultimately prove as great a boon as collodion did in the negative processes of old.

The principles involved in the process are few and simple, and they ought to prove a lesson to us as to what may be produced by genius from apparently insignificant means.

The keystone of the Woodburytype is a fact well known to us all, and has proved to be the starting-point of more printing processes than I could enumerate in the time at my disposal. I refer to the circumstance that gelatine and other analogous substances, when a bichromate is added thereto, become insoluble under the influence of light.

A moment's reflection on this will show that a layer of such a bichromatised gelatine will, after the unequal action of light and subsequent solution of the soluble portions, present a film of varying thickness. Suppose, for instance, I had a film of this nature, and upon it I placed, say, a penny (an article, by the way, more familiar than a five-pound note), and then exposed the whole to the action of light. Clearly all the portions but that covered by the coin would have become insoluble; and were I to dissolve away this covered portion I should have as a result a hollow disc corresponding in size to a penny, and, as a matter of course, raised portions all round. Now this action is found to bear an exact but inverse relation to the density of the negative; in other words, the action is greatest in the parts under the clear portions of the negative, less under the half-tones, and so on, until the parts protected by opacity are totally unacted upon. Thus, not only would a negative be represented on such a film or tissue in raised and sunken portions, but these elevations and hollows would also bear a perfect relation in relief to the shadows and lights of the negative.

As this may aptly be termed the "backbone" of the process I will proceed to enter more minutely thereon under the heading of the "relief." A bichromate is intimately mixed with a quantity of gelatine and water, and this is poured upon talc as a support and dried. This, as you will perceive, is similar to sensitised carbon tissue *minus* the colouring matter. With talc as a substitute for the paper the use of the transparent support will soon be obvious; other media beside talc may be, and are, used. The drying of these films is a troublesome operation; but, let this process once come fairly into play, and a little pressure on the dealers will bring into the market a tissue, with paper as a support, to be sensitised, dried, and developed like a carbon print.

We will now suppose ourselves in possession of a tissue of this kind on talc, and want to know the means for printing the same. You are all aware of the necessity for developing from the back in the case of carbon printing in order to preserve half-tone, and as we are dealing with similar materials it would be a waste of time to point out the necessity of the same rule being observed here. The use of the talc now appears. Being transparent it enables you to print from the back, and thus save transferring; so we will suppose the talc and gelatine placed in contact with the negative from which it is desired to obtain the relief. Now comes a most important point—one which, unless attention be paid to it, will bring about certain failure. I can best illustrate it in a manner familiar to us all. When it is desired to print a vignette, to produce this effect a piece of cardboard with a suitable aperture therein must be used. We all know the result of placing it in the direct rays of the sun. You obtain thereby a tolerably-sharp counterpart on your sensitised paper of the opening in the cardboard, with your picture, perhaps, struggling in at one side—an effect which cannot be pronounced either neat or gaudy; yet, when the same arrangement is printed in diffused light—or, as it is termed, "in the shade"—a quite different effect is the result. How is this? It is not difficult to explain, and ill, indeed, would it become me to attempt to explain an effect the cause of which is so obvious.

Now let us return to our negative with the sensitised film in contact and examine it. Obviously the gelatine has an appreciable thickness, and parts of the relief are, therefore, formed at some distance from the negative. Your attention need but be drawn to this circumstance to see that if diffused light were used for printing a relief the result would be more or less indistinct, and hence only parallel rays must be used in order to obtain a sharp image. This condition may be complied with if you print in the sun, of course keeping out diffused light. Artificial light may be employed. Mr. Woodbury used the electric light, which, however, will be found costly to fit up, besides increasing the exposure considerably. Whichever way the relief is produced the effect after development is such as you now have in your hands.

We now proceed to the production of the mould. At first electrotyping was employed; but this was superseded by the discovery of Mr. Woodbury that hydraulic pressure might be used. The delicate gelatine relief is placed in contact with a plate of metal, and these, placed between two perfectly-true steel plates, are then placed in a

press and subjected to a pressure of about four tons per square inch. It is my opinion that it is here where the chief difficulty hitherto operating in the non-application of this method of printing is to be found. The hydraulic press is a piece of apparatus few, indeed, would add to their plant. If ever the photo-relief process become generally employed one of two things must take place—either some firm will undertake to make the moulds, or some method better suited for general application must be employed. To this latter point we will devote a little time. Casting in wax, sulphur, and other analogous bodies is not to be despised. A gentleman (whose name I am sorry I cannot now give) some time ago called attention to the use of sealing-wax, and shortly after doing so gave a very valuable method whereby moulds can be easily made with a piece of apparatus which many of us have discarded—I mean a rolling-press. A piece of soft type metal was placed in a shallow steel box so as to allow of the type metal projecting slightly above the edge. Upon this was placed the relief, and a steel plate again upon the whole, and run through the ordinary rolling-press. A moment's reflection will show that no distortion can take place if care be taken not to have too much metal projecting.

Again: Mr. Woodbury names a means, included in a recent patent, where tinfoil is pressed into the hollows of a relief, and this is again backed with a suitable material. I have never seen any productions of this kind, but think they must be similar to those patented by Mr. Dallas in 1866, as he says—"I also mould with tin, lead, or other metal foil by beating it with a brush," and then some adhesive material is pressed well upon it. He further says—"Sunk surfaces prepared according to my invention may be employed to produce prints with half-tints." After describing the method, he says—"This method of printing is now known as photo-relievo printing." Perhaps you have had enough of the "relief," and to relieve you I will treat of the last point, viz., the printing, which I can put into very few words.

The principle involved in this operation is that varying thicknesses of a semi-transparent material give corresponding variety in the depth of tone; so that if a mould be filled with a semi-transparent ink, all but the portions which occupy the hollows pressed out, and a material be furnished to which the ink will adhere, the result would be a print in perfect half-tone. This is what is done in the process now under discussion, and some results of which you now see.

My object is accomplished if I have turned attention to the most valuable process not in general use—a process destined to mark a new era in our art.

W. E. Batho.

## ANOTHER EXPERIENCE.

The paper of Mr. F. York, read at the last meeting of the South London Photographic Society, induces me to come forward and render, if possible, some assistance in elucidating the vexed question of bath troubles.

To Mr. A. L. Henderson is certainly due the highest praise for having so generously given his experiences in this direction to the profession generally, and it ought to induce others whose practice is large, and who, having followed photography for a number of years successfully, to contribute their mite, so that by the combined efforts of all it may become a fixed point of practice.

In the early days of my work I used a bath of forty grains to the ounce, iodised with about four to five grains of iodide of potassium to the forty ounces, Ponting's iodised and Perry's bromo-iodised xyloidin collodions mixed together in equal proportion, and for years I was never troubled with pinholes. The sandy deposit I often got in hot weather, when I had done a quantity of work with the bath; but that was readily eliminated by filtering the same through a filter paper in which had been dissolved a fresh solution of iodide of potassium, about two grains to the ounce of distilled water. But Perry's collodion ceased to be made, and I then took to using Rouch's and Ponting's mixed, and to these I often added bromide of ammonium in the proportion of about one grain to the ounce. I preferred this bromide because it gave a limpidity to the material, which, from being used very often, otherwise became gelatinous.

In taking interiors I rarely met with stains or troubles of any kind, nor do I now, even with long exposures of an hour, owing, I think, to the "ripeness" of the collodion. Twice only last year did I meet with pinholes. The first I attributed to using an old camera the bellows of which had become very slack. I re-sized it, and the trouble ceased; but at the same time a fine actinic light had taken the place of dull, lowering, windy weather, and I afterwards noticed that during such weather there was always a tendency to spots, even though the bath was kept regularly filtered and replenished as to strength. The dampness or dryness of the atmosphere also made a difference in the working of the plate; oftentimes in fine but windy weather stains and oyster-shell markings appeared with only a few seconds' exposure, and but a very few minutes' keeping of the plate between its preparation and exposure.

All photographers must have noticed that in dull, bad light stains and markings are frequent—especially in interiors—in those portions of the plate that have had but little action to the actinic ray. In the same way, but of a different character, I am led to suppose that these pinholes are created. I have always taken them to be little undissolved portions of bromo-nitrate of silver, because they are not acted on by the fixing solution, and yet often make their appearance after the plate has been dried and varnished; indeed, with a microscope they may be observed as little atoms standing up from the surface of the plate. I have never met with them in fine, still weather, some action being set up by the light which has never yet been discovered. I am also inclined to think that both bromides, iodides, and nitrates in some way undergo a change; that the nitric acid in the baryta salt induces to cleanliness, while the salt itself removes the liability the bath had of originally forming what are called "pinholes." What this action is I cannot say.

My troubles have been greater from alcohol and ether forming in the bath, to remove and renovate which I adopt the following method:—I first add to the bath one-third of its bulk of boiling rain water, which makes it of a dirty yellow colour, from the emulsion of iodides, bromides, and organic matter. Then *shake well* and filter. Next, I sun the clear liquid for twenty-four hours, when a black deposit will be thrown down; again filter. I now boil it down to its original bulk in a china-lined saucepan; this eliminates the ether and alcohol. When cold I again filter and test for strength, adding silver and five grains of nitrate of barytes per ounce; test for acidity or otherwise, making it just acid, and lo! I have a new bath. I usually keep a Winchester of new bath always ready, and, like Mr. York, frequently only work it a week at a time, filtering every morning.

I have given this formula for correcting the bath to many others, who have found it of service, and, at the opening of a new season, I offer it to your readers in the hope that they may be benefited and profited thereby.

W. Harding Warner.

## THE LATE THOMAS SUTTON, B.A.

The unexpected and lamented death of Mr. Sutton, which we announced in our issue of March 26th, has hastened by a few months the publication of the following notes on his public career, which, under other circumstances, it was our intention to have given somewhat later in connection with our present regular biographical series.

Mr. Sutton made his first public appearance on the photographic stage in August, 1854, the occasion being a short letter on wooden clips; his next appearance was in October of the same year, when he wrote a letter in favour of albumen as against collodion negatives, both of these communications appearing in the *Journal of the Photographic Society*. Dry or, rather, preserved collodion plates were at that time not unknown, but had not yet been introduced except in the "moist" form; and the second communication to which we have referred was really one upon the advantages of a dry process as compared with a process in which a dark cab or other operating chamber was required. At that period Mr. Sutton, in conjunction with his friend M. Blanquart Evrard, was publishing a work entitled *Souvenirs de Jersey*, the former taking the negatives for that work by means of the negative paper process, with respect to which he then wrote—"I solemnly believe that the best paper work for views is absolutely finer than the best collodion work, and in this opinion I am borne out by some of the first photographers abroad."

Mr. Sutton's next contribution to photographic literature was a somewhat curious one, intended to be anonymous, but referring to a letter he had previously published, and which bore his real name and address. This latter letter was the first of a series of argumentative disquisitions on photographic lenses, in which he sought to prove that a single landscape lens of small diameter was not only quite as good as, but rather better than, a large lens of the same focus having a diaphragm placed at some distance in front. Mr. Grubb, of Dublin, controverted these opinions with much moderation of language, but with great force of argument, demonstrating the incorrectness of the diagrams drawn by Mr. Sutton in favour of his theory, as well as the reasoning by which those diagrams were sustained. Now this is a matter which is capable of being demonstrated to the satisfaction of any person who will put himself to a little trouble. Selecting an ordinary single achromatic landscape lens let two pictures be taken—one by the lens when the stop has

been pushed up in close contact with it, and the other when it has been removed to a distance from it about equal to its own diameter or more. Now compare the two pictures, and the latter will be found to be sharp from centre to margin, while the former will only have a sharp spot near the centre, all the rest being indistinct. This is a rough and ready, but perfectly effective, manner of testing the necessity for having the lens in a landscape combination so much larger than the diaphragm to be used in conjunction with it. In the controversy that followed the introduction of this subject Mr. Grubb had undoubtedly the best of the argument, and, probably as a result of the discussion, Mr. Sutton appeared to have been afterwards unable to entertain strong feelings of friendship towards Mr. Grubb or any of the optical productions of that gentleman.

In the invention of lenses, and in his numerous contributions on the optical branch of photography, Mr. Sutton displayed a wonderful degree of facility. We are inclined to attribut to the circumstance of his residing in Jersey, where he had not a convenient opportunity for making himself acquainted with what had been previously done in this department of science, the fact that his various inventions, where practicable, had been anticipated by others. To this, however, there was one exception, namely, his panoramic lens and camera—an instrument at one time well known to most photographers, at least by description. The lens consisted of a hollow glass sphere or ball, or, to speak more properly, of two hemispherical glass shells screwed together with a small stop between them. This was filled with water, the thickness of the shell being so adjusted as to render the sphere achromatic. As the oblique pencils were of the same focus as the central ones, it followed that a flat plate could not be employed upon which to receive the picture. The necessity, therefore, for using long cylindrical plates, with cameras, dark slides, baths, printing-frames, and plate boxes to suit, prevented the panoramic camera from getting into use; and when the pantascopic camera of Johnson and Harrison was afterwards introduced—a camera rotated by clockwork, and in which the negative was taken upon an ordinary flat plate—Sutton's panoramic camera rapidly fell into a state of desuetude. Nevertheless, it was a singularly ingenious instrument, and at the time of its introduction was undoubtedly the only instrument in existence—at least in this country—by which panoramic pictures could be obtained. Pictures of this class are now seldom taken—probably from the cost of the apparatus, and probably also from the fact of there being so few subjects adapted for panoramic representation. Wide-angle lenses are now constructed with a great degree of perfection, and if an extremely small stop be employed with one of these instruments an angle of more than eighty degrees may be included. With either of the panoramic cameras above-mentioned an angle of a hundred and twenty degrees is, however, obtained with facility.


THE LATE THOMAS SUTTON, B.A. (CANTAB.)

FROM A PHOTOGRAPH BY MR. A. L. HENDERSON.

In his search after a view lens that would give freedom from distortion, Mr. Sutton devised a triple lens of symmetrical construction. It consisted of two plano-convex achromatic lenses placed one at each end of a tube, with a double concave lens placed equidistant between them. Very few of these lenses were made; for, while they undoubtedly gave freedom from the distortion of curvature of the image so characteristic of all single combinations having a stop in front, yet other defects existed to counterbalance this advantage. A modified form of triple lens was soon afterwards introduced by Mr. Dallmeyer, free from the defects of the symmetrical triplet, from which period the latter were gradually discarded. Mr. Sutton, however, rendered great service to our art-science by the denunciations he levelled against distorting lenses; for we need scarcely observe that a leading feature in Mr. Sutton's disposition was this—that when he attacked anything he did so with an *empressement* characteristic of the man. His zeal was most intense and uncompromising, and when, as in this case, it was directed against an acknowledged evil, it was in no small degree beneficial. This made him welcome with more warmth, perhaps, than the occasion demanded the introduction in 1858 of Voigtlander's orthoscopic lens, which, although stated to give correct projection, in reality only substituted one kind of distortion for another. It was, however, extensively manufactured and imitated in this country under various names.

Passing from lenses to cameras: Mr. Sutton advocated strongly the production of cameras having rounded fronts, so as to admit of the lens being raised or lowered on a curve of which the centre of the plate formed the centre. From discussions which have taken place in this Journal our readers are aware how, and for what reason, we were unable to agree with Mr. Sutton in his estimate of the advantages likely to accrue from such an instrument. If a swing-back cannot be attached to a camera, then the most effective substitute for it is undoubtedly to be found in a swinging front, or a lens set in a ball-and-socket joint with facilities for raising or lowering the instrument.

A good chemist, Mr. Sutton was also an ardent experimentalist in photography. Many of his suggestions are valuable both in themselves and in their leading the mind onwards. He threw himself with great enthusiasm into progressive movements, and into none more so than in the introduction of carbon. For example: when, in April, 1858, he spoke of the receipt of some carbon prints from Mr. Pouncy, of Dorchester, he justly observed that carbon printing in various pigments would produce really good and permanent positives; but, less cautiously, added the confident prediction that before three months from the date of the publication of the article a revolution would be produced in positive printing, and the "abominable" silver process then in use be swept away and superseded by another which would satisfy both the artist and the chemist. Mr. Sutton lived long enough to become aware that photographers possessed at least sufficient conservatism to prevent them from giving up one process, defective though it might be, until they were assured that its successor possessed intrinsic merits sufficient to warrant their aiding in bringing about the revolution to which reference has been made. The process in question Mr. Sutton afterwards saw it to be his duty to discourage, and, as our readers are aware, he set about the improvement of albumenised paper by imparting to it a greater amount of gloss than it had previously possessed. This he effected by giving the paper a thin coating of gutta-percha previous to applying the albumen, which was thus retained on the surface, and for this he obtained a patent.

Mr. Sutton at one time advocated with great strength the printing of positive photographs by development, and, along with M. Blanquart Evrard, established a factory in which to carry out printing of this description, one advantage of which, in addition to others, he held to be enhanced permanence.

In the beginning of 1856, and while still residing in Jersey, Mr. Sutton started his journal, *Photographic Notes,* in which he advocated his own opinions with greater fulness and force than he could do in any of the then existing serials. That he would ventilate his opinions in no half-hearted manner, but throw his whole soul into the matter, was only to have been expected; nor was it to be wondered at that his forcible mode of expressing himself in particular

cases led on more than one occasion to the name of his solicitor having been demanded and given. But on these darker phases of his journalistic career it is unnecessary here to dwell. There was very much matter, especially in the earlier volumes, in *Photographic Notes* which was most valuable and suggestive; and, however much we may differ from the author in some things, it is impossible not to admire the unconstrained and original manner in which he has treated the various current topics of the period. At the commencement of 1868 the publication of *Photographic Notes* as an independent journal was discontinued, Mr. Sutton allowing it to be absorbed into a new weekly journal, the *Illustrated Photographer*, to which he was a leading contributor during the brief period of its existence. Started in 1856, the *Photographic Notes* had, at the date of its demise, entered upon the thirteenth year of its existence.

At a subsequent period Mr. Sutton became a resident of Redon, in Brittany, and remained in France for several years—indeed, up to a few months back. Our readers are aware that after the lamented death of Mr. R. J. Fowler Mr. Sutton became the French correspondent of this Journal, in addition to which he was a frequent contributor. In the earlier period of Mr. Sutton's journalistic career he was rather prone to mixing with his ink an undue amount of gall, this being quite foreign to his natural disposition, which was kind and genial; still, too frequently was interrupted that *esprit de corps* which, otherwise, would have marked his intercourse with his fellow-writers and brother journalists.

Among the excellent and practical suggestions for which photographers are indebted to Mr. Sutton the following is one of the value of which we are able to speak from experience. It is a method by which photographs of the most ordinary quality may be utilised in a mode replete with advantage for book illustration, while to tourists and travellers it is exceptionally valuable. The photograph having been printed, a sheet of lithographic tracing-paper is laid upon it, and, by means of a fine quill or steel pen dipped in lithographic transfer ink, a drawing is made of those parts which it is desirable should be reproduced in this manner. The subject may easily be drawn by anyone who has acquired facility in pen-and-ink sketching, and it may be made very artistic. It is then transferred to a lithographic stone and printed in the usual mode. Pictures too bad to be issued as pure photographs may in this way be utilised and rendered really charming works of art, while at the same time they possess that accuracy of drawing so inseparable from the productions of the camera.

We cannot close this necessarily brief summary of the public photographic labours of our deceased *confrère* without alluding to a process he worked out to a satisfactory issue, and by which he took many excellent negatives. We allude to the *moist* collodion process. Moist processes, as we have said elsewhere, have been known almost since the period when collodion was first introduced as a photographic medium, but Mr. Sutton's moist process possessed some advantages over all others. It was introduced through the medium of our Journal just two years ago, during the time of his residence at Redon. The plate was coated with a bromo-iodised collodion, sensitised in a silver bath in the usual manner, then thoroughly washed, and coated with a preservative composed of—albumen, one part; water, one part; and glycerine, two parts. After draining, the plates prepared by this method were placed in the plate-box or slides, taken to the country and exposed, the development being effected a day or two afterwards. This was done either by the alkaline or acid pyro. method, according to the exposure received. We have here given the outline of this useful process to enable those desirous of trying it to do so at once; we hope, however, to have a special article on the process in the course of the next few weeks, when we shall give detailed directions for practising it. Referring to this process, Mr. Sutton wrote—"By means of moist plates we are able to take a step in advance of what has hitherto been done."

We may incidentally remark that Mr. Sutton fulfilled for a short period the duties of lecturer on photography at King's College, after Mr. Hardwich's retirement from that well-remembered scene of our reverend friend's early photographic labours. But a London life was unsuited to the peculiar temperament and not over-robust health of Mr. Sutton. He withdrew from his position at King's College, and returned to the more congenial and peaceful retreat of his favourite residence in Jersey.

As we stated in our previous notice [*ante* page 147], Mr. Sutton was born September 22nd, 1819, at Kensington; took his degree at Cambridge, in 1846, as twenty-seventh wrangler; went to reside in Jersey in 1847; removed to Redon, Brittany, in 1867; returned to this country at the close of last year; and his sudden decease was the result of a severe attack of cramp in the stomach, his death taking place at Pwllheli, where he had latterly resided, on March 19th of the present year.

Our portrait is engraved from an enamel by Mr. A. L. Henderson (by whom the negative was also taken), and it was esteemed by Mr. Sutton, as well as by his relatives, as the best likeness ever taken of our departed friend. It is undoubtedly an excellent likeness.

## LITTLE THINGS.

In more than one communication which has recently appeared in these pages something almost amounting to a complaint has been made against the manufacturers of photographic appliances, to the effect that they are hardly so attentive as they might be to the wants of their customers, or, rather, that they are more ready to push that which is likely to pay best than to give due prominence to an article from which but small profits can be derived. Now, while admitting the possibility of there being some truth in these charges, I have no hesitation in saying that I consider photography is quite as much indebted to those whose duty it is to cater for it in the mechanical, optical, and chemical departments as any other branch of science.

If any of my readers really wish to form an idea of the immense amount of enterprise, ingenuity, and skill that have been expended in this way I would advise them to visit the warehouses of any of the dealers in photographic apparatus and appliances in London or the large provincial towns. If they do so I have no doubt they will be able to carry away with them a very largely-increased estimate of the importance of photography as a commercial institution.

Our cameras, both as regards design and workmanship, are as nearly perfect as it is possible for them to be; and the lenses of all kinds, and for almost all possible purposes, are constructed with the greatest possible precision and mechanical perfection. While the more important instruments have thus received all due attention the lesser articles have not by any means been neglected; and so we find tripods of great lightness combined with the most perfect rigidity, chemicals of absolute purity, and frames and mounts in such endless variety of style, and so elegantly got up, as to exercise a wonderful educational influence on all who are brought into contact with them in the ordinary course of business.

If anything further were required to show that our manufacturers are fully alive to the necessity of keeping abreast with the demands of the ever-changing phases of the art we certainly have it in the fact that they do not work spasmodically, or, as it were, by "fits and starts," but have their arrangements so perfect that they are at once in a position to carry out orders for anything new that may be presented to them, from the apparatus and appliances for the production of medallion pictures to the infinitely more complicated and more important arrangements for photographing the transit of Venus.

While, however, I am satisfied that no effort has been spared to produce everything that can be required, and that of the best possible quality, in the larger and even in most of the lesser articles in daily use, I hope to be excused when I say that there is room for some improvement in what may be called the "little things"—trifles, probably, in the estimation of many, but trifles on which much of the comfort of the photographer, and especially of the amateur photographer, depend; and, as complete success can scarcely be looked for under circumstances of discomfort, I am almost warranted in saying that even such trifles will be found to contribute very largely to successful work.

There is probably no operation in the production of a negative in which comfort and its attendant, coolness, is more necessary than in that of the development; and yet I only speak from experience when I say that, in nine cases out of ten, the amateur either works with a light so feeble that he has to guess at his results, or so strong and of such a quality that he cannot keep his shadows clean in any but the slowest work. Now there can be no need for anything of this kind. All that is wanted is, for those who have gas in their laboratories, an ordinary globe of a rather deep orange colour, and for those who have not, a paraffine lamp chimney of the same material. With such a globe over a small burner, or such a chimney on a common paraffine lamp, work becomes a source of pleasure, and, all other things being right, success is a certainty.

I am aware that such globes and chimneys as I now recommend were at one time to be obtained in London; but as I have repeatedly, and recently, tried without success to obtain them, I am afraid that, for some reason, the manufacture of these useful articles has been discontinued. I hope that somebody will resume it, as they were most valuable additions to the dark room.

I am aware that many dealers keep in stock lanterns with orange glass; but as they have generally a candle as the illuminating

agent the light given out is too feeble for comfortable work. I much approve of a form of lantern that I have seen recently. It is in the form of a pyramid, three inches square at the base, and nine inches in height. The base is a paraffine lamp, three of the sides of yellow glass, and the fourth of white glass. The arrangement is such that no chimney is required. It gives a steady, brilliant light, needs little or no attention, can be hung up anywhere, and when a white light is required has only to be turned round.

Another "little thing" is the trouble we sometimes have with dishes. Gutta-percha and ebonite have had their day, but both have, to a large extent, especially the former, given place to porcelain. Porcelain trays, however, are by no means as perfect as they should be. They are generally far from flat in the bottom, and too near the size of the plate they are nominally supposed to hold. A few days back I wished to prepare some 12 × 10 plates and immerse them in a preserver of which I had but a limited quantity. For this purpose I required a 12 × 10 tray; but, to my astonishment, on measuring, one by one, the whole stock of a dealer there was not one in which the plate would reach the bottom. They had evidently been moulded to the precise size, but the contraction caused by drying and the effect of the slight bending had reduced that size by more than one-eighth of an inch. The general sizes of plates are well known, and the manufacturers should remember that at least a free inch is always necessary—a 12 × 10 tray requiring to be at least 13 × 11, and that not at the top only, but also at the bottom. While speaking of trays I cannot avoid congratulating photographers generally on the happy idea of Mr. Werge in producing trays of enamelled iron, as mentioned in a previous number. If he will only see that the enamel be of a suitable quality they will, I am sure, become popular.

There is yet another "little thing" I am surprised has not received more attention—the developing glass. There are, no doubt, great varieties of them on sale, but, with few exceptions, they are not what are required by the photographer. A good developing glass should possess two characteristics—freedom from corners at the bottom, and be slightly bell-shaped in the mouth; whereas most of those I have seen can with difficulty be cleaned, and do not admit of the solution being poured from them with that full sweep which, in some cases, is so necessary to prevent markings in the film.

Attention to these and similar "little things" on the part of our enterprising dealers would, I am convinced, prove a great boon to photographers generally, and a source of profit to themselves.

John Nicol, Ph.D.

## FOREIGN NOTES AND NEWS.

The Vienna Photographic Society. — M. Noel's Methylated Alcoholic Developer. — Alcohol in the Silver Bath. — Dr. van Monckhoven's Developer Again.—The Physical Properties of Collodion Films.—Experiments with New Formulæ.—New Order of the Prefect of Police.

Some time ago a translation of M. Noël's paper on the methylic alcoholic developer was read before the Vienna Photographic Society, and several of the members undertook to experiment with it and give the Society the benefit of their labours. Our readers will recollect that this methylic alcohol is wood naphtha, and not what is commonly known in this country as methylated spirit of wine. The subject came up again for discussion at a recent meeting of the same Society.

Herr Haak said that, though the shortening of the exposure by five-sixths—as it was alleged could be done by employing the wood spirit—would be a great advantage, especially in dark weather, he feared that that shortening was a boon beyond the power of the wood spirit to bestow. He had made several experiments with it, but had not found any marked difference between the sensitiveness of a developer charged with this spirit and an ordinary developer. He compared the sensitiveness of the developers thus:—He exposed a plate in a stereoscopic camera fitted with two Voigtlander lenses of exactly the same focal distance; he then divided the plate, and placed the two halves simultaneously and for the same length of time in the different developers, and obtained very similar results.

Dr. Hornig said that perhaps the reason why Herr Haak found no acceleration of development might be attributed to the doubtful purity of the spirit he employed. It was obtained from a hardware manufacturer, who imported it from England and used it, instead of spirits of wine, as a foundation for brown spirit-varnish. Dr. Hornig was still of opinion that it would be worth while to experiment further with really pure methylic alcohol, and he undertook to make these experiments himself.

It seems to us quite absurd that persons claiming to be considered scientific men should bring forward statements of what they profess to be the result of certain chemical combinations when they have not put themselves to the trouble of ascertaining whether the chemicals they employ are pure or not. These gentlemen cannot be unaware that the presence of apparently slight impurities will completely alter the character of the result obtained by the mixture of certain chemicals, and thus make their experiments worthless.

Professor Husnik called the attention of the meeting to his method of adding alcohol to the silver bath, by means of which he believes he can economise the silver, owing to the assistance rendered to the coagulation of the albumen by the alcohol.

Herr Carl Haak spoke at some length on Dr. van Monckhoven's developer. In the course of his remarks he said that he had compared its action with that of an ordinary developer in the following manner:—In the presence of Herr Beyersdorff he took two stereoscopic views of a colour scale by the light of a petroleum lamp, divided the plates, and placed them, one in the ordinary and the other in Monckhoven's developer, for an equal length of time, and the best result was obtained by the latter. A letter was read from Dr. Monckhoven in which he expressed great surprise that Dr. Schnauss should have found "gelatine, or some other organic substance," in his developer, which really contains no trace of any such substance. He was also astonished that Dr. Schnauss had put himself to the trouble of analysing it after he (Dr. Monckhoven) had said that it was merely specially prepared sulphate of iron and had promised subsequent details. He further suggests that the organic matter may have been in some of the vessels employed by Dr. Schnauss when analysing the developer. It seems a pity that Dr. Monckhoven should have begun by making such a mystery of the composition of his developer.

M. Jamin communicated to the last meeting of the French *Académie des Sciences* a note by M. E. Gripon on the physical properties of collodion films. His experiments had been made with films of collodion spread upon glass, and, when desiccated, removed from the glass and stretched in tiny frames. These films were found to polarise light in a similar manner to glass, the angle of polarisation being 33° 35′ or 56° 25′ with the surface and the normal respectively. From this the index of refraction $n = 1.5108$ (or rather less than that of crown glass) is deduced by the law of Brewster. By the aid of this index the thickness of these films was found to be less than one-hundredth of a millimetre, the exact numbers varying from ·0081 millimetre to ·0088 millimetre. In spite of the extreme tenuity of the films they were found to offer great resistance to the passage of radiant heat, the power varying with the source of heat. In the case of luminous heat proceeding from a moderator lamp, or a taper placed in the focus of a metallic reflector, ·91 of the heat was allowed to pass. When the source of heat was a blackened vase containing boiling water the transmitted heat was reduced to ·70, and the proportion continued to decrease as the temperature of the water decreased. These collodion films are said to be much superior to mica as usually employed in the study of radiant heat, and, though fragile, are so easily made at a moment's notice as to be worthy the attention of those interested.

A correspondent of the *Moniteur de la Photographie* complains that he has been experimenting with the new developing formula recently noticed in this column, consisting of the substitution of wood spirit for alcohol in the ordinary developer, and also in the addition of sugar to the collodion, but without any success. He also calls attention to an anomaly in the French law, as it at present exists, which presses very hardly on photographers. He has, he says, in company with other photographers in Paris and the provinces, received a notice from the Minister of the Interior ordering him to send into the prefecture four prints from each negative taken in his establishment. If the pictures are allowed to be published each copy printed will bear a government stamp. It may be simple enough; but the correspondent points out where it operates unjustly. He says:—"I am asked for a dozen photographs 21 × 27 of a mansion taken from three different points of view. According to the instructions of the minister I must deposit four copies from each negative, so that I require twelve copies for my client and twelve for the prefecture. Again: I have done for an important public body a large proof whole sheet, of which only one copy is required. However, I must print five, four of which go to the prefecture, unless, indeed, I prefer to reproduce it as a *carte*." He goes on to ask "is this just?" and, looking at it with English eyes, we are inclined to think it is not.

## OUR CLUB.

### No. IV.—The Man's "Secret."

Major Brown arrived at the Club accompanied by a young, smart, intelligent-looking lad, who carried examples of the new work. This youth was introduced as Mr. Buckmaster and the Major's travelling companion. We had (to use a theatrical expression) a crowded house, and, in as few words as possible, I introduced the stranger to the audience, feeling sure that "my friend, the Major," was quite competent to tell his own story; in fact, I thought that he would not have been a bad hand at *enlarging* if anyone were in need of a hand for that purpose.

As the Major stood up he ran his fingers over the little desk as if he were trying to find out if there was not too much fatty matter about, and as he looked down at the gentle incline he seemed as if he would like to give it some advice regarding its health. "Gentlemen," he began, with a dry cough, a drawing up of the shoulders, and a gentle patting of his brow, and travelling all over his smooth pate with a coloured silk pocket handkerchief—"Gentlemen, Longfellow, the bard of the western world, has said in one of his moments of inspiration, 'Learn to labour and to wait!' I may without fear of contradiction say I have laboured, and, gentlemen, you have no longer to wait.

"I come here this evening to introduce to your notice a process which is second only to that of obtaining natural colours direct, and as we hold a provisional protection for this process of ours I am in a position to enlighten you so far in the matter as, I believe, will induce you—indeed I may say, make you—eager to buy our invention, which cannot fail to be the groundwork of producing for you untold wealth. Mr. Buckmaster will now show you some of our samples of work, which, I say without fear of contradiction, are as fine productions as any of the gentlemen here have ever had the pleasure of examining in their lives before. This assertion may seem like presumption on my part, but I repeat it again and again."

Mr. Buckmaster then handed round to the assembled company an immense variety of pictures, from *carte* up to 12 × 10 sizes, all of which were coloured. In all cases, both in portraits and views, the colouring looked a "wash-on." No appearance of stippling or working-up was visible on any of them, but certainly they looked very effective pictures. After the samples had gone the round of the room, and the general opinion given in favour of them, the Major proceeded:—

"Now, gentlemen, this colouring that you have admired on the pictures which you have just seen is not obtained by the hand, but by means of lithography, and our process is as follows:—Suppose we wanted to produce coloured backs for a whole-plate view such as this" [here he held up a picture] "we blend the lithographic ink from the blue of the sky here down to the brown and green of the foreground. The colour is then run on to the stone in stripes just the width of a whole-plate picture, starting at the sky and finishing at the ground, these stripes repeating themselves all over the stone. The plain paper is then printed and, when dry, albumenised; so you can in a moment perceive that any amount of printing, washing, toning, and fixing can be done without the slightest chance of interfering with the colouring. As to the effect produced, you have but to look at this picture to see that the thing is not only theoretical but practical. With regard to portraits it is slightly more difficult; but you can see from those that we have now shown how near perfection we can come. You have but to study the size of head for each given size of picture from *carte* up, so as to have the flesh tints, dress colours, &c., blend as naturally as possible. Now, having given you this rough outline of what we do, the following is how we do it:—For the working of our process we charge a sum, and we will supply to all who buy the same the papers ready coloured for working it. These papers cannot be produced cheaply, for it has cost us thousands on thousands of pounds to produce them. We fear not for the venture; it must be a grand success. I will, if you will allow me, call upon you individually tomorrow, when I will give you my terms, and will be glad to receive your commands. Before closing I wish to bear testimony to the gentlemanly way I have been treated all over the profession. Some of the most gentlemenly men I have ever met have been in your profession. I say this without fear of contradiction; and, mark me, I have travelled all over the world, and amongst the human race have met many races. I do not mean this for a racy remark," he said, with the faintest smile; "for I do not indulge in levity. It has been an intense pleasure to me to have been with you this evening; for I hold that it is by communication, conversation, and a continual interchange of ideas with each other that we will ever attain anything like perfection. Thanking you for your kindness both for myself and my friend, and trusting to see you tomorrow, we, with your permission, will now take our leave."

"Good morning, Mr. Oute," exclaimed the Major, with a grand flourish, as he entered my studio the next day.

"Good morning," I replied. "Well! how have you got on with your process?" I thought from his manner that he must have done some good.

"Oh! pretty fair; sold it to four people. That will pay us, you know, and when we have your name we close our book for the town."

"Well, I fear if you wait for my name for the closing of your book you will have to carry your book away open."

"What!" exclaimed the Major in astonishment, "throw away the certain chance of a fortune!"

"I don't see my way to go in for it just at present," I said quietly, not wishing to have any argument on the merits of the secret.

"Well, look here," he said, in a mild, persuasive tone, "you have done me a good turn, and 'one good turn deserves another.' Now, I'll do you one. I have sold the right to work our patent here to one man for twenty pounds, I have sold it to another for fifteen pounds, and to the other two at ten pounds each. Come, now, I'll give it to you for five pounds. I'll just put down your name," and he flourished his note-book and pencil as I replied—

"No, thank you. But, Major," I continued, "do you not consider it a great injustice to the man who bought at twenty pounds to sell to another at fifteen pounds, and an injustice to the fifteen-pound man to sell at ten? and you sit on the lot by selling to me at five pounds. I think it's a vile shame."

"My dear Mr. Oute, calm yourself," he replied, with a laugh. "My little game is to make all out of it that is in it, and when I have squeezed it dry I'll drop it. You will observe each pressure does not bring an equal amount of liquid gold, but I take what the gods send me and am thankful. Uniformity of price, sir, is a blooming error. There is no uniformity in nature. When you talk of justice and injustice in a matter like this you descend to the level of a common tradesman."

Shutting up his book he put it into his pocket, then tapping me on the chest he remarked—"Take care of your health; exercise music; you know the rest. Thanks for all your kindness," and he grasped my hand whilst he flourished his shiny hat over head. "Farewell!" he exclaimed, "I will never forget you," and with a military air he strutted out of the studio into the sunlight, and this was the last I saw of the Major.

Mark Oute.

## Meetings of Societies.

### WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting of the above Society was held at the Victoria Hotel, Bradford, on Monday, the 5th instant,—the President, Mr. J. W. Gough, occupying the chair.

The minutes of the previous meeting were read and confirmed.

The Chairman proposed—"That a sale and exchange list, for members' use only, be issued with each monthly notice of meeting; and that each notice of any article for sale or exchange be subject to a charge of threepence for the first eighteen words, and threepence for each extra nine words."

Mr. A. W. Beer seconded the motion.

Mr. Mori most heartily supported the resolution, remarking that it would be much more satisfactory to know the person with whom you were having the transaction, besides there being a possible opportunity of seeing the article offered. He had on more than one occasion exchanged through the medium of an advertising journal and been victimised. There was no means of redress.

Other members expressed their approbation, and on the motion being put to the meeting it was unanimously carried.

The following gentlemen were then elected members:—Mr. Braithwaite (Leeds), Mr. Gunson (Bradford), and Mr. Appleyard (Brighouse).

Mr. Howarth then exhibited to the Society, by request, a model of his stove for heating studios, which was inspected with much interest by the members, he (Mr. Howarth) taking it to pieces and explaining the principles of its construction.

Mr. W. E. Batho laid on the table the three carbon prints referred to in his communication on the continuating action of light in carbon printing (see The British Journal of Photography, March 26), which were handed round, the general opinion being that there was no material difference in the three prints.

After some desultory conversation thereupon, Mr. Batho read a paper on *The Woodbury Process*. [See page 209.] A number of reliefs and copies from paintings by the eminent firm of MM. Goupil and Co. were handed round for the members' inspection, the prints being greatly admired, and pronounced by several to be equal to silver prints.

In reply to a question by a Member,

Mr. Batho stated that the pressure required for the production of the relief was very considerable, being estimated by some at about four tons to the square inch; but he believed the prints handed round were produced with a pressure of about one hundred tons, which was considerably under the other estimate.

On a Member inquiring if lead would answer for making the relief,

Mr. Batho said that it would not bear printing to any extent. A mixture of lead and type metal was employed as being more serviceable.

The Chairman inquired if lead and bismuth were not employed.

Mr. Batho suggested that the Chairman was probably thinking of fusible alloy. He (Mr. Batho) had tried it but found it would not answer. A metal fusible at a low temperature was not necessarily soft.

Mr. Smith was of opinion that the mechanical photographic processes were worthy of the more general attention of professional photo-

graphers, and should receive more consideration than they did. It was not so much a matter of £ s. d. as the advancement of the art, and photographers should devote more time and attention to them.

Mr. Wormald said it was a matter of £ s. d. to most photographers. The process, to be effectually carried out, would require a very considerable outlay for mechanical appliances, hydraulic presses, &c. If anyone could be found who would undertake the making of the reliefs it would be a different matter.

In reply to several remarks,

Mr. Batho said the Woodbury process was not more difficult than any other of the methods of reproduction; but, of course, it required some amount of practice. Any person trying a new process must expect to meet with difficulties, and must make up his mind resolutely to master them.

The Chairman remarked that one great difficulty with many photographers was that they received information regarding these processes by instalments, and thus did not get to know them sufficiently well. If the method were published in a concise and practical form no doubt more attention would be given to it. It was of great importance to know the *modus operandi* of any mechanical printing process that could be used commercially.

A hearty vote of thanks was accorded to Mr. Batho for his very interesting paper.

Mr. Batho, in replying, made several remarks regarding the present method of doing business. He was of opinion that photographers ought to discard the traditional dozen *cartes* and endeavour to get larger orders, and then mechanical printing processes would be found economical. The matter was worth the consideration of photographers who were anxious to raise the standard of business.

Mr. Berlon said there would be some difficulty in persuading the public to change its method of doing business; it had been tried by more than one photographer of reputation. He believed Mr. Sarony had tried the experiment. He had commenced doing *carte* portraits at thirty for £1, but he had returned to the dozen. Mr. Wake had also tried departing from the generally-accepted method by charging for the negatives, irrespective of what number of pictures might afterwards be ordered. For the first negative he charged 3s. 6d., for the second 2s. 6d., and for further negatives 1s. 6d. each, but he had not found it to pay. The matter lay more with the public than with the photographer; and so long as the public chose to abide by the present method of doing business the photographer had no choice but to acquiesce.

After a few more remarks of a conversational character the matter was allowed to drop.

Mr. Berlon inquired if any member had tried the addition of methylic alcohol to the developer, instead of the ordinary methylated spirits of wine. He (Mr. Berlon) had been using it according to a formula given in the *Photographic News* for February 12, and had found considerable advantage in its use during the late dull weather. He was of opinion that there was a gain of almost one-half in shortness of exposure.

Mr. Appleyard said he had also tried it and had found a similar advantage, though he scarcely thought to the same extent as Mr. Berlon had experienced.

Several members expressed their intention of trying the addition, and reporting on a future occasion.

After a little further conversation the meeting was adjourned.

## Correspondence.

### Silver Iodide in Emulsions.

The introduction of silver iodide into a bromide or chloro-bromide emulsion confers on it a remarkable increase of sensitiveness. This is a fact that had been quite unknown until I lately communicated it to the Journal, and I therefore cannot pass unnoticed the following remark contained in a recent letter published by you:—"Mr. Lea is now introducing iodide into emulsions, as though it were a novelty and an idea of his own. In your issue of August 28th, 1874, in my paper read before the British Association, he will find that *I* recommended iodide in an emulsion," &c.

On the contrary, I made it very clear in the paper in question that M. Gaudin, fourteen years ago, first proposed to emulsify silver iodide. I feel that I have much right to object to these very frequent perversions of my language which Colonel Wortley makes. His privileges of criticism are without limit; but criticism, to have any value, or indeed any meaning, must have as a basis a correct statement of the matter criticised.

After showing in passing that there was a general misapprehension as to the facility of emulsifying silver iodide—which, whether Colonel Wortley was aware of it or not, undoubtedly existed—I proceeded to state my discovery, which was as to the remarkable increase of sensitiveness produced by the addition of silver iodide in certain proportions. That this property of silver iodide was totally unsuspected up to the date of my publication it will be easy for me to prove abundantly by citing the language of well-known experimentalists—language much too clear to leave any doubt upon the subject.

In an article in *Photographic Mosaics*, reprinted at page 78 of The British Journal of Photography for 1874, Dr. Vogel says of silver iodide that it "is of hardly any value in plates which are to be developed with an alkaline developer; *it is better not to employ it at all in such plates, as it is only a* USELESS BALLAST." A well-known contributor to the Journal—who is now, unfortunately, no longer among us—said at page 28 of the same volume:—"It seems, therefore, that the part played by the iodide of silver in washed bromo-iodised films is simply to act as *inert yellow colouring matter* in preventing flare, whilst, at the same time, it LENGTHENS THE EXPOSURE."

These views were expressed without a dissenting voice, and undoubtedly represented the universal opinion on the subject. The action of silver iodide was misunderstood, and for a very simple reason *it was employed in much too large a quantity.* I obtained at first, using likewise too much, exactly the same result; but my studies on the action of the less refrangible rays on silver iodide and bromide made me certain that there *must* be conditions under which silver iodide would materially increase, instead of diminish, the sensitiveness, and I therefore varied the conditions, and with immediate success. The results were so decisive that I at once saw that in the future silver iodide must come into universal use in emulsions.

A reference to his paper which Colonel Wortley cites shows that he spoke of the use of silver iodide *solely in respect of its power to check blurring*—a fact familiarly known for years, and referred to expressly in one of the above extracts from a paper published months before Colonel Wortley's. In my own paper the advantage gained in this respect by the introduction of silver iodide is spoken of in most favourable terms, but not as a discovery, which would have been simply absurd, as the action of silver iodide in that respect has been long known. The discovery was of the gain in sensitiveness by the same means.

On this subject of sensitiveness—the essential point—there is in the whole of Colonel Wortley's paper *not one word.* The subject of that paper was astronomical photography; it is well written and interesting, but silver iodide is referred to in it in passing only, and in reference to its capacity to check blurring. Four silver compounds were examined as to their effectiveness in this respect; of these silver iodide is one, and is condemned as being the least useful of the four.

The case, therefore, stands thus:—Previous investigators who had studied the action of silver iodide in plates intended for alkaline development, so far from discovering its power to increase sensitiveness, condemned it as "useless ballast" and tending to "lengthen exposures." Colonel Wortley did not even examine the question; his reference to silver iodide was merely in connection with its power (already universally known) to check blurring.

M. Carey Lea.

### THE BEER AND ALBUMEN PROCESS.

*To the* Editors.

Gentlemen,—Will you kindly allow me space in the Journal for a few comments on the above unfortunate process, about which there has been so much written that there is still a doubt as to its origin.

Your correspondent "Caledonia," in a recent number of the Journal, claims for Mr. Davies, of Edinburgh, the introduction of the beer and albumen process as published by Captain Abney. Be this as it may, I must leave the gentlemen concerned to settle the point between them, my object being to call Captain Abney's attention to a little matter which he has thought fit to entirely ignore, and that is the fact of his having first seen the *beer* process in its simplest and easiest form at my father's studio in Derby, and that the formula was there given to him, and the whole process practically explained, it having been then constantly in work in the business for many months.

I now ask your careful attention to the above statement, and feel confident that you will, in the interests both of the art-science we all profess and also of the simplest honesty and justice, endeavour to place before your readers a proper explanation of the discovery and invention (if such terms may be used in so simple a matter) of the process that I myself worked out, and, as above stated, gave to Captain Abney, and which, with the addition of albumen (the utility of which is practically valueless), has so strangely been claimed by, and commonly awarded to, Captain Abney.

As to the merits of the process which I claim I am in a position to affirm that it is the most simple, easy, and practical method yet discovered of preparing dry plates, and that the addition of albumen to the

formula is only so much unnecessary complication. I shall have the greatest pleasure, if you and your readers desire it, in publishing my experience in connection with the process, so as to show plainly how I became acquainted with it, and why I have hitherto remained silent on the matter.—I am, yours, &c., RICHARD KEENE, JUN.

*Anlaby Road Studio, Hull,*
*April* 26, 1875.

[Mr. Keene is possibly not aware that ale as a preservative has been in use for a *very* long time, indeed—perhaps ever since the month of March, 1855, when a strong recommendation was published in favour of preserving plates with wort in preference to the other materials previously employed. From the fact of the (photographically speaking) great antiquity of such a preservative it was scarcely to be expected that Captain Abney, or any one else who might have occasion to write or speak about it, would publish the name of the person by whom he first saw it practised, it having been so familiar for years to the readers of photographic literature. Will Mr. Keene be kind enough to supply us with the date at which he worked out and published the "beer" process? If he has been in the field before anyone else we are desirous of awarding to him the full credit of its introduction. We shall also be pleased to receive *details* of his method of working, so as to enable us to form an estimate of its value, as compared with modern innovations on simple beer.—EDS.]

## THE CHLORIODO-BROMIDE PROCESS.

*To the* EDITORS.

GENTLEMEN,—I have read with much interest your experiments with Mr. M. Carey Lea's new process, but trust that leisure will permit of your carrying them on still further, as a very important point has still to be settled, namely, whether there is really any great advantage to be gained by employing in the process a chloriodo-bromide collodion instead of a plain bromised collodion?

The complicated formulæ of the former will, I feel sure, deter many amateurs from attempting the process, and perhaps, after all, equally good results might be obtained with a bromide pellicle treated with a suitable preservative.

The determination of which is really the best preservative opens a large field for experiment, and I trust that before the summer season commences it will be thoroughly explored; for there can be no doubt that the washed emulsion process surpasses all others in convenience.

Should Mr. Lea's formula prove, after trial, to give superior results, I hope that steps will soon be taken to supply the emulsion as a commercial article at a reasonable price.

I tried the other day to emulsify a sample of bromised collodion to which I added two grains of iodide of ammonium per ounce, but utterly failed; both bromide and iodide of silver were precipitated, and no amount of shaking had any effect on it.—I am, yours, &c.,

*Morristown Lattin, Naas,* GEORGE MANSFIELD.
*April* 26, 1875.

[In our remarks upon Mr. M. Carey Lea's new process we have merely given our experience with the chloriodo-bromide emulsion *per se*, testing it against plates prepared by the ordinary emulsion processes and also against wet plates. Whether a washed bromide emulsion prepared upon the same principle will or will not possess an advantage in point of rapidity we cannot at present say, but shall probably be in a position to do so shortly. Setting rapidity on one side, the chief gain in the employment of an iodide rests in the fact that it enables us to dispense with the use of a "backing"—in itself a matter of no small importance. Undoubtedly a collodion containing iodide is more difficult to emulsify than a simply bromised one; and we are not surprised at our correspondent's want of success, as a very slight variation from Mr. Lea's relative proportions of bromide and iodide will be found sufficient to cause failure. Mr. Lea's directions are to adhere strictly to his formulæ.—EDS.]

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

REGISTRATIONS AND EXCHANGES.—In our next.

CAPTAIN S.—Yes; see an article in the present number.

W. A.—The back numbers mentioned by you are out of print.

E. D.—The advice sought we shall give through the medium of a private letter.

RECEIVED.—*Handy Guide and Catalogue of Magic Lanterns*, by A. Wilkinson, Sunderland; "A. F.;" and "Bookseller."

ALEX. P. TAYLOR.—We are making inquiries, and expect, in the course of a few days, to meet with what is required.

R. T. D.—While there is difficulty in applying a legal remedy, the moral wrong involved is not a whit lessened thereby. We cannot offer any advice in the matter.

SURPRISED (Manchester).—Without repeating the experiment we are unable to indicate even the probable cause of your failure. The numbers required are out of print.

OPERATOR.—The purity of your piece of gold may be ascertained either by the hydrostatic balance, if you are sure that it has been alloyed with silver, or by means of a chemical assay.

G. REID.—If you forward the photographs we shall be happy to give you our opinion as to their merits. We imagine, however, that, owing to the pigment employed, they will be rather coarse and ganular.

J. B. SCOTT.—This correspondent inquires "What is methyl?" We reply: it is the hypothetical radical of pyroxylic spirit and the methyl series.—2. Iodide of methyl is a volatile, heavy, colourless liquid insoluble in water.

L D. L.—1. The flat side of the condenser must be placed next to the light.—2. A small piece of tin placed slightly sloping above the lower lime cylinder will prevent any light emanating from it falling upon the upper condensers.

MUCA.—1. A bottle of retouching varnish which we sometimes employ with excellent effect was prepared according to the same formula. Try the effect of increasing the proportion of the castor oil.—2. The emulsion is very sensitive, but we have not made comparative trials with the two kinds named.

B. B. L.—When using gelatine as an agent for effecting the transference of collodion films from glass, let it be of such a thickness as to form a film which, when dry, will be about the thickness of good writing paper. To give pliability to the film a little glycerine ought to be mixed with it. We presume you are aware that by immersing a collodion picture in acidulated water the film will become detached from the glass.

WANDERING PHOTOGRAPHER (Castres).—1. Arrangements are being made for the introduction of white enamel plates into this country. Notification of their arrival will be made by advertisement in this Journal.—2. They can be used wet, just as the ferrotype plates are.—3. The ferrotype plates afford the best means for taking and finishing a portrait while the person waits.—4. Thanks for the offer to lend us the late Mr. Fowler's portrait, but we fortunately possess a copy from the same negative.

J. H. E. (Liverpool).—1. Gelatine was at one time recommended as a substratum, but it has now given place to albumen. The plates you have prepared with the gelatine substratum will doubtless turn out all right.—2. To observe the peculiar effect of sulphate of quinine the solution must be *very* strong. Make a concentrated solution in a solvent consisting of one part of sulphuric acid to two parts of water.—3. Your opinion of backing plates quite coincides with our own, as expressed in an article in the present number. Glycerine ought always to be added to the backing material.

Z. (Ventnor).—Do not apply the varnish to the paper until you have previously given it two coats of size. If this precaution be not adopted the varnish will be absorbed and the purity of the paper, as well as the design, quite destroyed. The best size for the purpose is prepared by dissolving isinglass in water in the usual manner; that is to say, it is soaked in cold water for a short time, and a little hot water is then added, by which it is immediately dissolved. You will, of course, understand that this solution may be clarified by stirring up with it, while nearly cold, some white of egg and afterwards applying heat, by which the albumen becomes coagulated, carrying down with it the opaque matter.

BOSS (Regent-street).—It is not required by the statute that any mark shall be impressed upon a registered photograph announcing the fact of its registration; on the other hand, it is illegal to print the words "registered" or "entered at Stationers' Hall" upon pictures that have not thus been entered. Once more: the mere entering of a photograph at Stationers' Hall will not alone secure you copyright in the picture; for, under the provisions of the first section of the statute, the photographer must have a written agreement with the person for whom he takes the portrait before he can hold copyright in such a portrait, no matter whether he has registered it or not. Registration alone, therefore, does not secure copyright.

ST. MUNGO.—At the time your lens was made all the portrait lenses constructed by Voigtlander differed in respect of the coincidence of the visual and the chemical foci. There was a philosophical reason for adopting this mode of construction. It was afterwards considered advisable to bring the actinic and visible foci to the same plane. Your lens, therefore, is not necessarily "bad," although you appear to encounter great difficulty in discovering the way to use it properly. We shall merely add that when you *have* discovered the proper way to employ it—which can be ascertained from articles devoted to this particular topic in former issues of our ALMANAC—you will then find that the lens will work with great sharpness and rapidity.

COLONEL STUART WORTLEY sends us a note in reply to Mr. M. Carey Lea, from which we make the following extract:—"When Mr. Carey Lea attacks me for claiming the 'discovery' of the necessity of an excess of nitrate of silver in emulsions he takes a wrong view of my claim. The point at issue (and which I do not ask you to allow me space to argue about), is in THE BRITISH JOURNAL OF PHOTOGRAPHY for February 10, 1871. Mr. Carey Lea, who had tried large proportions of silver and failed to see their value, in urging on you the fact that ten grains in winter and nine in summer was the correct amount per ounce for an emulsion, wrote—'And if I do not use still more, it is only because I do not see the use of loading down the solutions with silver.' In my paper read before the Society four months afterwards I combated this view, and pointed out that not only did I 'see the use' of loading down the solutions with silver, but that it was a *necessity* of good emulsion work."

INTERNATIONL EXHIBITION OF 1876, PHILADELPHIA.—The applications for space in the British Section of this Exhibition are numerous, and of a satisfactory character. In consequence, however, of arrangements recently communicated by the American authorities, whereby the time for Foreign Commissions to make definite application for amount of space required is extended, it will be possible for the British Executive to receive applications from intending exhibitors, addressed to 5, Craig's Court, Charing Cross, London, up to the 15th of May inclusive.

CONTENTS

# THE BRITISH
# JOURNAL OF PHOTOGRAPHY.

No. 783. Vol. XXII.—MAY 7, 1875.

## DISCOVERIES IN CONNECTION WITH GLASS.

The public mind appears to be not a little beclouded as regards certain sensational announcements which have recently appeared in some of the daily and weekly journals relative to the discovery of a method whereby glass can be freed of the usual brittleness without having its other qualities impaired. Statements of the most contradictory character have been made respecting the novel qualities said to be imparted by the application of the new mode of treatment. In one paper, for example, we find it asserted that a wonderful degree of elasticity, together with an amount of induration surpassing that of the very hardest gems is imparted—that it acquires properties scarcely a whit short of malleability, while at the same time its compactness is so great as to cause it to withstand percussion by a sledge hammer, and soforth. In what follows we shall endeavour to furnish on this subject reliable information obtained from the best sources.

A key to the contradictory assertions made is to be found in the fact that there are *two* inventions, both having reference to the imparting of new properties to glass, these properties being essentially different. By one of these a considerable increase of tensile strength and elasticity is imparted; by the other the glass is rendered exceedingly dense and hard. These we shall briefly describe in detail.

With respect to what has been termed "toughened glass," we must first of all, and in deference to historical accuracy, observe that this is no new thing. The glass-maker to the Emperor Tiberius produced (is it not told us by Pliny, and others?) a vessel of glass which, having been bent in consequence of being thrown to the ground, was immediately straightened by means of a hammer. But that was a long time ago. Rather let us go back for the brief period of (say) fifteen years, when certain glass manufacturers, having to supply glass of an unusual flexible description for lighthouse purposes, made such a modification in the method of annealing as to fulfil the required conditions. This was effected by plunging into oil the partially-annealed glass. We request this to be borne in mind, as the modern discovery bears such a marked similarity to it. This recent discovery may be summed up in few words:—A French engineer, M. de la Bastie, while experimenting with Réaumur's process for converting glass into porcelain, managed to produce glass which was devoid, in a greater degree than previously, of brittleness. The usual results followed. A company, with large capital, was formed to work the process, which had hitherto been a secret one. The secret is now divulged. The glass is heated to a certain temperature, and is then suddenly immersed in a bath of oil or similar substance. A rival and independent inventor, Professor Bauer, found that by heating the glass to such a degree that it could be bent, and then immersing it in melted paraffine at a temperature of 200° Fahr., followed by rapid cooling, the requisite degree of induration was obtained. It will be seen that between the modern methods and that we have indicated as having been brought into use by the requirements of the lighthouse service there is a marked similarity. Elasticity or springiness certainly results from the treatment indicated, and the toughness or cohesion of the atoms of which the glass is formed is so great as to render it very useful in many branches of the arts now that public attention has been directed to the matter.

The question arises—In what way is the glass affected by the treatment referred to? We reply: photographers, above all other persons, are aware that a peculiar kind of hard skin characterises the surface of glass formed naturally, but which hard skin is removed by grinding. When, a few years ago, we described Mr. Forrest's method of preparing and polishing his very popular patent-plate substitute, we spoke of the advantage of preserving the natural skin, because on account of its hardness and closeness of texture it did not absorb, and was unaffected by, the chemicals used in photography. When this elastic, hard surface is removed by grinding and polishing the glass then acquires properties different from those it previously possessed, being now, to some extent, soft and spongy. The sudden cooling of the heated glass in a bath of oil or paraffine appears to impart to the whole body of the glass the resilient property which, under the older circumstances of annealing, the mere surface would alone possess. Metallurgists know that by treating iron in a particular manner with certain substances it becomes "case-hardened"—that is to say, the *surface* of the iron is converted into steel; whereas by a modification of the treatment the whole substance of the iron is converted into steel. This simile will, perhaps, serve to convey better than any elaborate statement the nature of the change which takes place in the glass by the sudden arresting of the—at one time deemed necessary—annealing process aforetime considered imperative. Our contemporary and neighbour, the *Builder*, referring to the new properties imparted to glass by the treatment we have indicated, has the following remarks:—

"Articles manufactured from it may be thrown against a wall, across a room, without breaking. When thrown down the object emits a singular sound without breaking, but if violently thrown to the ground it is smashed into innumerable fragments. Water may be boiled in a glass saucer over a fire, and the latter suddenly removed to a comparatively cold place without affecting the saucer. If a corner of a piece of glass is held by the hand in a gas-flame until it becomes very hot the heat is not transmitted to the other portion of the glass, nor does the glass crack from unequal expansion. While a two-ounce weight falling on a piece of common plate-glass from a height of twenty-four inches will break it into several fragments, the same weight falling on a thinner piece of hardened glass from heights ranging from two feet to ten feet produces no impression, the weight simply rebounding from off the glass. An eight-ounce weight, tried at two feet and four feet respectively, does not injure the glass, but upon the height being increased to six feet the glass breaks. Instead of breaking into about a dozen pieces, however, like ordinary glass, it is literally smashed to atoms, as happens in the case of its being violently thrown to the ground. It would thus seem that hardened glass possesses enormous cohesive power, but that if its equilibrium is too violently disturbed at any one point the disintegration extends throughout the whole piece, the atoms no longer possessing the power of cohesion."

It is rather unfortunate that when glass has been subjected to those hardening influences which carry with them so much benefit it ceases to succumb to the cutting powers of the diamond. This

difficulty, we dare say, will be surmounted eventually; but, meanwhile, it is necessary that the plates be cut to their proper dimensions before being toughened.

Many useful applications of this invention will suggest themselves to the photographer; but passing by such obvious applications as are associated with the manufacture of baths, dishes, and vessels for chemical purposes, there is one which, we think, ought not to be lost sight of, namely, the extinction of the brittleness of opal glass plates upon which photographs have been printed and upon which a large expenditure may have been incurred in colouring. A picture of this description costing sixty or eighty guineas might easily be fractured and its value destroyed; by the process described this danger would be greatly lessened, if not wholly prevented.

But we must pass on to the second process applicable to the annealing of glass indicated at the commencement of this article. It is different from the other process, having only for its object the rendering of glass exceedingly hard and dense. The process has been patented by Mr. Macintosh, of Westminster, a civil engineer, who has devoted much time and attention to the hardening of iron, steel, and alloys. Starting on the broad ground that the lower the degree of temperature of the liquid in which certain heated bodies were plunged the harder such bodies became, Mr. Macintosh has found that glass, graphite, uncrystallised carbon, slag, and other analogous substances, may be rendered exceedingly hard by means similar to that just indicated for metals. Coloured glass may, by this treatment, be rendered so hard as to be effectively used as a substitute for gems, and, what is curious, may be pulverised and used in the same way as diamond dust or emery powder.

In hardening the substance the method pursued by the patentee is to place a small quantity of fused or nearly fused clear or coloured glass in iron or other moulds to shape the glass, and the substance is taken out of the moulds and placed in platinum moulds, and fused or nearly fused and suddenly deprived of its caloric by frigorific mixtures of iced water and salt, or any of the freezing compounds that produce extreme cold; the sum and substance of which is that the glass is heated to a very high degree of temperature and then rapidly cooled in a very frigid fluid. A startling statement is made by Mr. Macintosh when he asserts that, when the component parts of gems are treated by the above process, he is enabled to produce thereby fictitious gems *even harder than real diamonds*. This statement, if correct, is a pregnant one.

It may be asked—How will this latter invention affect photographers? In reply, we say only from a lenticular point of view, if at all. The enormous density which appears to be imparted to glass by the treatment described may have a powerful influence upon the uses of optical flint and crown glass; but for the present, not knowing the alterations of the angles of refraction and dispersion made, it will be wiser to avoid speculation until a substantial basis on which to rest has been found.

## CHEMICAL NOTATION.

If all our readers would take the trouble of acquiring even the minimum amount of chemical knowledge really requisite for the intelligent, as well as for the successful, carrying on of the various operations incident to our art-science there would be no necessity for such an elementary article as we now propose to write. We are aware, however, that while many have, with laudable zeal, done this, and even much more, there is a considerable number of photographic devotees for whom the science of chemistry has no charms, and to whom the simple but expressive system of notation in general use is merely an unmeaning array of letters and figures. Over and over again, in conversation with even photographers of eminence, when the discussion had reference to articles in which symbols had been used, we have heard statements such as the following made:—"Yes! I have no doubt the article was very interesting; but the fact is, I really cannot make out the meaning of the string of letters and figures—the $H_2O + SO_3 = H_2SO_4$ and so on—and, therefore, just pass on to the next." Now there would be some excuse for this state of matters if a knowledge of the method of using symbols were difficult to acquire or a severe tax on the memory to retain; but, so far from this being the case, we can unhesitatingly say that a man of the most moderate ability may, by half-an-hour's study of any one of the numerous excellent text-books of chemistry, thoroughly master the theory, and by two hours' practice become perfectly at home in its use.

In this, as in most other cases, we know that the cry of "*cui bono?*" is too often raised; but we do not know any case in which it is more easily answered. Chemical nomenclature—by which we mean the names given to substances—has not by any means been universal or constant. Take the case of corrosive sublimate (mercury bichloride) for example. Within our own recollection it has been at least twice changed in order to bring it into agreement with the advancement of chemical knowledge. Calomel (mercury chloride) has, in like manner, been subjected to curious changes. At one time it was "mercury bichloride;" then "mercury chloride;" and now the colleges have gone back to the old "*calomelans.*" While, however, names are thus subject to change, the composition of bodies remain fixed quantities, and those two salts remain today as they were when first formed, $HgCl_2$ and $HgCl$—symbols that tell their own stories in an unmistakable manner to all who possess the simple key.

The system of chemical notation, or the use of symbols, has been called a system of shorthand writing, by which, with the aid of a few letters and figures the composition of any body may be shown, and, better still, the changes which occur when two or more bodies are made to act and react on each other, and this altogether independently of diversity of tongue or difference of nationality.

Although not quite accurate, it is sufficiently so for our purpose, to say that the system of chemical notation is founded on the hypothetical atomic theory of Dalton. "Hypothetical," because hitherto impossible of proof, but worthy of acceptance, as explaining, better than anything else, the laws of chemical combination which can be proved. Dalton started the idea that the simple bodies of which the matter of our world is composed, and which may be divided and subdivided until so minute as to defy the highest microscopical power for their detection, had yet a limit beyond which division could not go, and to this minute particle of matter he gave the name of "atom." Taking that as his starting-point he supposed that those particles or atoms varied much in their respective weights, hydrogen being represented as weighing one, while oxygen weighed sixteen, nitrogen fourteen, carbon twelve, and so on. When teaching this theory an eminent professor was wont to compare the elements to articles of merchandise in the warehouse of a wholesale merchant. Hydrogen, being a valuable article, was sold in single pieces; carbon, of less value, was put up in cases containing twelve; and lead, much cheaper, was found in packages of two hundred and seven, and, the dealer refusing to break bulk, the purchaser had always to take an original case. On the supposition that this theory is true, it will be evident that, when elementary substances combine with each other, it will always be in quantities equal to their atomic weights or in multiples thereof; and such, of course, is always the case. A single example will make this plain. Oxygen unites with nitrogen to form five different compounds:—

1. Nitrous oxide, $N_2O$,
2. Nitric oxide, $N_2O_2$,
3. Nitrous acid, $N_2O_3$,
4. Hyponitric acid, $N_2O_4$,
5. Nitric acid, $N_2O_5$,

the oxygen thus increasing in atoms of sixteen, while the nitrogen remains the same.

The sixty-three simple bodies at present known are each symbolised by the initial letter of their Latin names, or, in cases where there are two with the same letter, the one of lesser importance has a small letter in addition. Thus "I" represents iodine; "Au" *aurum*, or gold; "Ag" *argentum*, or silver. Of course it must be kept in mind that the symbol does not simply mean gold, silver, or iodine respectively, but the proportions in which those elements combine with other simple bodies, namely, 197 parts of gold, 108 of silver, and 127 of iodine—always by weight. Certain quantities of each element being thus easily represented, it becomes a matter of much simplicity

to show at a glance the composition of any particular compound, and that, too, in a way not possible of being misunderstood, as is the case with the name in too many instances. The word "sugar" conveys an idea only to those who are familiar with it; but the symbol $C_{12}H_{22}O_{11}$ would show to the initiated, not only that it is composed of carbon, hydrogen, and oxygen, but the number of grains of each that exists in any particular quantity, viz., carbon 144, hydrogen 22, and oxygen 176 in every 342 grains of the substance. Still more valuable are symbols in showing the decomposition of compounds and reconstruction of the elements into new substances. Take, for example, the case of fermentation, by which some of the elements of sugar are converted into alcohol. Suppose the discovery had only now been made, and that the discoverer wished to convey an idea of the whole process and the changes involved to his *confrères* throughout the world. Many pages of writing would fail to make the matter so plain as the following simple equation, the ability to comprehend which, as we have already said, may be acquired in less than half-an-hour:—

$$C_{12}H_{22}O_{11} + H_2O = 2C_6H_{12}O_6 = 4CO_2 + 4C_2H_6O,$$

which shows in the clearest and simplest manner that a molecule of cane sugar to which has been added a molecule of water becomes grape sugar, and that it in its turn becomes split up into four molecules of carbonic acid (more correctly, carbon dioxide) and four molecules of alcohol.

Or take another illustration, which we copy from Miller, in which the action of hydrochloric acid on calcium carbonate is shown:—

$$\underbrace{\underset{\underbrace{40+12+16\times3}_{100}}{CaCO_3} + \underset{\underbrace{2(1+35\cdot5)}_{73}}{2HCl}}_{173} = \underbrace{\underset{\underbrace{40+35\cdot5\times2}_{111}}{CaCl_2} + \underset{\underbrace{1\times2+16}_{18}}{H_2O} + \underset{\underbrace{12+16\times2}_{44}}{CO_2}}_{173}$$

where 100 grains, say, of marble is acted on by 73 grains of the acid, the resulting products being 111 grains of calcium chloride, 18 grains of water, and 44 grains of carbonic acid. The sign $+$ implies that the substances between which it is placed are mixed together, while the sign $=$ does not mean exactly equal to, but rather that the bodies to the left of it, if mixed with due precaution, yield the products symbolised on the right.

A numeral placed to the right, and below a symbol, implies that it is multiplied to the extent of the value of the figure, while one placed on the left, and generally on the level, shows that all the elements until the next comma, or all that are within brackets, are so multiplied. Thus—

$$K_2CO_3 \times 2C = K_2 \times 3CO$$

show that one molecule of carbonate of potash and two atoms of carbon yield two atoms of potassium and three molecules of carbon oxide.

In conclusion: we are certain the advantages to be derived from an acquaintance with chemical notation are so obvious that we need say little more by way of recommendation. Chemistry and photography are so intimately connected that everything which contributes to the advancement of the one cannot fail to have a bearing for good on the other. Chemical writers could write with more ease, and their contributions would occupy less space, if aware that all their readers were familiar with notation; while the readers would soon realise the fact that a new pleasure was opened up to them in the ability to comprehend with facility the most intricate chemical changes by means of a few letters and a few figures.

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In the present number will be found two contributions we have received on the subject of Mr. M. Carey Lea's recently-published chloriodo-bromide processes. The writers of both are well known in photographic circles as able experimentalists, and, occupying as they do the front rank amongst the authorities on emulsion matters, are fully qualified to treat the subject they have undertaken. The spirit of their respective articles is essentially different, though we cannot help thinking that virtually the results of their experiments will be found the same. We are highly gratified to find so careful an experimentalist as Mr. H. Cooper agree as he does in every point with the results we ourselves obtained. With his remarks upon the ease with which the iodide is emulsified in the presence of excess of soluble salts we perfectly agree. It matters little whether silver nitrate or soluble bromide be in excess; but it appears that when these salts are present in sufficient quantity to nearly neutralise one another the difficulties commence. The preservative of tannin, gallic acid, and glucose which we recommended—not as a novelty, for we have used it ever since its introduction by Mr. Verity more than ten years ago—we find has also been successful in Mr. Cooper's hands; while his evidence tends to corroborate our opinion with regard to Mr. Lea's compound of albumen, tannin, &c., viz., that little, if any, albumen remains in the clear solution. Mr. Stillman, if we understand him rightly, condemns the process on theoretical grounds, which, we think, is scarcely fair. Theoretically, as we have shown in a previous article, an emulsion containing iodide of silver *should* be less sensitive than a simply bromised one; but experiments made according to Mr. Lea's formulæ leave little doubt that such an emulsion may be formed possessing quite as great rapidity as a bromised one. It must be remembered that Mr. Lea claims that the increase of sensitiveness depends upon the combination *in certain proportions* of the iodide and bromide. In Mr. Stillman's calculation of the quantity of silver nitrate required to combine with the haloids in the collodion he treats the cadmium bromide as if it were anhydrous, using the equivalent of 136. It is very doubtful whether such a salt really exists, the ordinary commercial salt when dehydrated still retaining, as Mr. Lea has shown recently, one if not two equivalents of water, raising the equivalent to 145 or 154 respectively. This would make a considerable difference in Mr. Stillman's calculation, though we must say we think that Mr. Lea has understated the quantity of silver necessary. With every respect for Mr. Stillman's opinion we think it unnecessary to reopen the question of priority of discovery in emulsion matters. That photography is deeply indebted to Mr. Lea for his services in connection with emulsions no one will for one moment deny; and we would call Mr. Stillman's attention to an article in another column where he himself receives full recognition at the hands of Mr. Lea for a suggestion previously made in connection with a different subject. We are at present engaged in experiments to determine the difference in sensitiveness between a bromised and chloriodo-bromised emulsion prepared on Mr. Lea's principle, and shall report the results shortly.

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## TRANSPARENT SPOTS, FILAMENTS, AND MOTES IN WET AND DRY PLATES.

One of your correspondents lately inquired as to the cause of certain transparent spots which occasionally present themselves in dry plates. I believe I was the first to call attention some years ago to the influence of *hyposulphite dust*, arising chiefly from hyposulphite solutions being spilled upon the floor, then being detached by the friction of the feet, and so getting into the air of the room. I have long suspected that the transparent spots in question arose from the source just named, and from some recent observations I am now quite sure of it. I think Mr. Stillman has somewhere made the same suggestion. These transparent spots appear just as easily on wet plates as on dry ones, under circumstances that permit it.

There are two quite distinct kinds of these transparent marks. One is a larger sort, sometimes nearly one-tenth of an inch in diameter, and is remarkable for being exactly circular—as exactly as if cut out with an instrument. Sometimes there is a fine black dot in it; if so, this black dot is exactly at the centre. The other sort is smaller considerably, more hazy, and less regular. Generally it is about the size of a pin's head, varying from that of an extremely small one to one somewhat larger. This sort of spot is apt to appear, when it does appear, more numerously than the other.

Now both these sorts have, in my opinion, precisely the same origin—hyposulphite dust—and, consequently, the question arises—How is this remarkable difference to be explained? The answer is simple enough. The first sort—the larger and exactly circular—are caused by particles of dust which fall on the plate *before* coating; the latter sort by particles which settle on the film itself.

As all photographers brush off the plate immediately before coating, it may be asked how it is possible for a particle of hyposulphite dust to escape removal? The answer is that particles adhere

with more force than is commonly supposed. Everyone has doubtless noticed that, either with wet or dry work, although the plate may have been brushed off immediately before coating and the collodion freshly filtered, yet specks will sometimes, nevertheless, make their appearance, visible as the collodion dries. These specks, if examined with the microscope, will generally show a minute fibre, which gathers a little knot of collodion round it by capillary attraction. If the collodion has been well filtered it is evidently impossible that it should contain these fibres; and the plate, having just been brushed off, the conclusion ordinarily come to is that the particles in question have settled from the air during the coating. I am now satisfied that this is not always the case, but that these particles are there most commonly because the brushing has failed to detach them.

The brush universally used for this purpose is a flat camel's-hair or badger brush, about two inches wide and extremely soft. The long pliant hairs easily slide over particles on the glass, and although they certainly remove most of what is present they undoubtedly do not remove all. For that reason I have lately substituted a bristle brush, such as used by house painters, and I recommend the change to all photographers for wet plates as well as dry. The brush should be applied with some force.

If a particle of hyposulphite dust settle on a plate previous to coating, and escape removal by brushing, it becomes embedded in the film. It is perfectly insoluble in the mixed alcohol and ether. As soon as the film is wetted, by plunging into the negative bath or into a preservative (in the case of a chloro-bromide emulsion), the hyposulphite dissolves and spreads equally in all directions, making a small but perfectly regular circle, whose size will depend both on the size of the particle and upon the nature of the aqueous solution. In the case of wet plates this particle, if large enough, may, before entirely dissolving, convert a minute quantity of silver salt into silver sulphide, and thus a black point is produced in the centre of the circle. In any case, as far as the solution spreads through the film there is insensitiveness produced.

This form of transparent spot is common to all sorts of plates, and occasionally troubles even the most careful workers with wet plates. The smaller transparent dots caused by hyposulphite dust may be formed on any plates which are exposed to its influence after the plate is made. Naturally dry plates are much more exposed to this danger than wet, and may easily receive the dust whilst drying. In this case, the dust resting on the surface, it partly sinks in and is partly washed off when the plate is wetted for development. Enough is absorbed to destroy the image for a small space around, but this space is evidently much more limited than when the particle is under the film. In this last case the solution is necessarily slow and regular, and the entire quantity of hyposulphite present does its work. But when the particle lies on the surface part is dissolved off and part only sinks in; hence the difference in size and in regularity.

Long since I remarked upon the great advantage to be gained by separating all work connected with hyposulphite from all other photographic operations. This is the most certain way of avoiding these marks. Lately I had occasion to make two or three washed emulsion dry plates at the very spot where I use hyposulphite, and where some had been spilled. It chanced that these plates received an edging of india-rubber, and were then set in a rack. Some time after, when the edging was completely dry, they were brushed off with a camel's-hair brush, and coated. These plates proved eminently instructive. Any dust present had, of course, settled equally upon the edging and upon the glass, but with this difference—that it could be brushed off the one and not off the other. Accordingly, when the plates were developed and fixed, there were quantities of these circular transparent marks on the part of the film over the edging, on the portion inside—one or two, perhaps, to each plate. These had resisted the brushing with the soft brush, but might have been removed by the use of the other.

It seems important to recognise the facility with which a soft brush may slip over dust particles of all sorts, whether chemical dust or mere filaments arising from disaggregated woollen fabrics, carpets, and clothing. It is, of course, essential to have a perfectly clean surface. I do not like rubbing, because it tends to make the surface electrical, and to cause it to attract motes from the air. The best method that I have been able to find is the bristle brush, which will be found useful for all work, wet and dry. M. Carey Lea.

## THE CHLORIODO-BROMIDE PROCESS.

Since Mr. M. Carey Lea published his formulæ for the introduction of an iodide into bromide emulsions I have made many experiments with the process, and should have written a short article on the subject three weeks ago had not business suddenly called me away for a few days. The appearance of the leading article of April 16 so fully anticipated many of the remarks I had jotted down that I deferred writing until some other experiments were completed.

I must congratulate Mr. Lea on what I consider a very great step in advance, for I believe his recent formulæ contain the germs of a very perfect process. Mr. Lea is certainly entitled to our warmest thanks for what he has already done for emulsion photography. I, for one, can fully appreciate the amount of labour his experiments must have entailed, and admire the perseverance and acumen with which he has worked. Having myself devoted much time to emulsion work, and to attempts to improve the processes in use, I know only too well the amount of work and study that such experiments demand.

As I hope to be able, during the next few months, to give my attention to emulsion work almost exclusively I propose from time to time to give jottings of any points that may arise in the course of my work, as I believe it is only by the united labours of many minds that any process can be brought to perfection.

In emulsifying a collodion containing an iodide several new difficulties arise; but Mr. Lea, and also our Editors, have already insisted upon many details to which great attention must be paid in order to ensure success, so I need not here enlarge upon such points as the use of a suitable pyroxyline, the method of adding the silver to the collodion, or the due shaking of the emulsion.

During the last few days a fact of importance has been brought most forcibly before me, and as it may account for very diverse opinions being expressed on the possibility of effectually emulsifying iodide of silver I mention it now. This is, that iodide of silver may be emulsified in the presence of a *large* excess of soluble salts, either of bromide and iodide or *of nitrate of silver.*

In experimenting with various pyroxylines I have lately met with three samples which caused the emulsion to behave in the following manner:—On adding the first portions of nitrate of silver a most lovely emulsion was formed, which gradually became clotted as more silver was added, until, when twenty-five grains to the ounce had been added, the whole of the sensitive salts were precipitated, and no amount of shaking, constant or intermittent, appeared to be of the least use.

Now comes the curious point. Invariably on adding five grains more of nitrate of silver to each ounce of emulsion the sensitive salts instantly emulsified, giving a very satisfactory film.

If any workers with the new process have failed to emulsify the salts, after attending to all the directions already given by Mr. Lea, I would strongly advise their trying the addition of a further quantity of nitrate of silver.

In the case of the emulsions just spoken of, the addition of a small quantity of unsensitised collodion was sufficient to again clot and precipitate the sensitive salts, proving that, in these instances, the very large excess of silver nitrate was absolutely necessary. For the sake of clearness I make a note here of the formula used in these experiments:—

| | | |
|---|---|---|
| Crystallised bromide of cadmium | 9 | grains. |
| Bromide of ammonium | $2\frac{1}{2}$ | „ |
| Iodide „ | 2 | „ |
| Pyroxyline | 10 | „ |
| Ether (s.g. 735) | 5 | drachms. |
| Alcohol (s.g. 805) | 3 | „ |

Just before use two drops of *aqua regia* are added, upon which the collodion assumes a deep red tint. The addition of free iodine is unnecessary. From twenty-five to thirty grains of pure nitrate of silver are now placed in a tiny flask with fifteen minims of water, and heated over a spirit-lamp until solution is effected. Three drachms of absolute alcohol are now poured in, and, if the silver be precipitated, the flask must be again warmed until the silver is perfectly dissolved. Add to the collodion in the usual way, and after an hour's interval add two grains of cupric chloride or cobalt chloride dissolved in fifteen minims of alcohol. As the collodion is much improved by age it would be worth while for anyone not having any old plain collodion by them to try and obtain some from one of our collodion manufacturers. Without being invidious I may mention that Rouch's plain collodion answers admirably for emulsion work.

*Organifiers.*—Like our Editors I have experienced great difficulty in making the compound so strongly recommended by Mr. Lea, viz., gum, albumen, sugar, gallic acid, and tannin. If the albumen be made strongly alkaline with ammonia the mixture is perfectly feasible, and is one I have used a good deal in my old emulsion work; but for our present purpose acidity is a *sine quâ non,* and with acid albumen I have not yet succeeded in making a clear mixture. I tried the effect of an acid mixture of albumen, sugar, and gallic acid, and for plates prepared with the emulsion in its first stage it gives a

splendid quality of image; but when tried for the washed pellicle I find that a portion of the dried pellicle is insoluble in ether and alcohol.

Curiously enough, before reading the leader of April 16th, I had used with good effect the mixture of tannin, gallic acid, and glucose there spoken of so highly This mixture has been in my note-book for years, and is there headed "Verity's tannin solution." The only alteration for present purposes is to render it strongly acid. The organifier is thus made:—100 grains of the finest tannin, 100 grains of gallic acid, and 100 grains of glucose (grape sugar) are dissolved in twenty ounces of hot distilled or soft water. When cold the solution is filtered, and two ounces of alcohol and half-an-ounce of glacial acetic acid added. I hardly know yet whether to give the preference to this mixture or to the following, both being excellent:—

| | |
|---|---|
| Tannin | 5 grains. |
| Sugar | 5 ,, |
| Forty-eight-grain alcoholic solution of gallic acid | ½ drachm. |
| Saturated solution of salicine | 2 drachms. |
| Water | 1 ounce. |
| Acetic acid | 15 minims. |

The pellicle should be allowed to remain in a good quantity of either of these organifiers for at least half-an-hour. The organifier must never be used a second time.

For filtering the solution of the washed pellicle I find nothing better than closely-woven *shirting*. This is first prepared by boiling with an alkali and thorough washing to get rid of all impurities. When dry it is cut into circular filters. One of these pieces of calico used like a circular paper filter, in one of Maynard's collodion filtering bottles, is very perfect in its action. A Maynard's filtering bottle is almost indispensable for the worker with washed emulsion. As the linen filter is kept moist by the vapour of the alcohol and ether it may be used many times without removal. I have attempted to use methylated alcohol for the first solvents, to save expense, but at present without much success.

*Sensitiveness of New Washed Emulsion.*—Although the amount of sensitiveness obtained with Mr. Lea's formula is very great, I hope soon to be able to report a further augmentation of the sensibility of the films. The most sensitive plate by Mr. Lea's formula which I have yet obtained was produced in a rather roundabout manner. I had sensitised several samples of collodion, and when they had stood twenty-four hours, being then ready for evaporating, organifying, washing, and drying, I received a telegram calling me away from home. Not knowing what else to do with all these emulsions I prepared a plate at once from each, and having found they all worked well in their unwashed condition I mixed them all together and added an equal bulk of unsensitised bromo-iodised collodion. After remaining for a week untouched I proceeded to re-sensitise the mixture by adding first two drops of *aqua regia* for each ounce of bromo-iodised collodion previously added, then twenty-five grains of silver nitrate for each ounce, and, finally, two grains of cobalt nitrate. After standing for twenty-four hours this emulsion was treated with the tannin, gallic acid, and glucose organifier, thoroughly washed, dried, and redissolved in ether and alcohol; and the plates prepared with it are very good indeed.

Henry Cooper.

## THE BEER AND ALBUMEN PROCESS.

[A communication to the Liverpool Amateur Photographic Association.]

Your Secretary suggested yesterday that I should prepare and read a paper on the result of my experience with the beer and albumen process, particularly with reference to those points which require the greatest care when testing this process for the first time, and for the want of which knowledge I failed continually during my earlier trials.

This process was first introduced by Mr. W. H. Davies, of Edinburgh, and is much used by the members of the Edinburgh Photographic Society. Subsequently, however, Captain Abney published a somewhat different formula in the early part of last year, and having tried both formulæ I may state that my most successful results have been obtained with that of Captain Abney, to which in future I intend to adhere, and my remarks will accordingly be directed principally to that modification of the process.

The glass plate requires a substratum, the cleanest and most efficient being a solution of gelatine, which is made thus:—

| | |
|---|---|
| Gelatine | 75 grains. |
| Distilled water | 60 ounces. |
| Ammonia | ¼ ounce. |
| Alcohol | 1 ,, |

It is better to place the gelatine in twenty ounces of cold water and, when softened, to add forty ounces of hot water.

I have tried albumen as a substratum, but prefer gelatine, as it is freer from specks, and enables the collodion film to adhere to the glass so tenaciously that a strong stream of water will not injure the film; neither does it injure the bath, as is the case with albumen. I apply the solution with a Blanchard brush.

An old or porous collodion is a necessity. I am quite sure that I can attribute many of my early failures to the want of a suitable collodion. The sample with which I succeeded best was supplied to me by Messrs. Rouch and Co., of London, and the negatives now before you were taken with this collodion. Messrs. Rouch and Co. call it "D" or special bromo-iodised collodion. It had been in my possession, iodised, for ten months, and when poured upon a plate had a very slight tendency to solidify like jelly. To this collodion—in quantity eight ounces—I added two ounces of newly-iodised collodion, and then to the whole ten ounces I added two grains per ounce of powdery pyroxyline and one grain per ounce of cadmium bromide. I found the collodion to be exactly what I wanted—namely, of a creamy consistency when poured upon the glass plate, and after immersion in the nitrate bath giving an even, white film like opal glass.

As regards the nitrate bath: it should be forty grains to the ounce; and here let me state that the larger the bath the better, more even, and reliable will be the sensitive plates. Any bath of the requisite strength which gives a clear wet-plate negative will do for this process. The time of immersion is about four minutes.

From the silver bath the plate is transferred to a bath of distilled water, and is then rinsed under the tap for half-a-minute, after which it is ready for the preservative, which is made thus:—Procure three bottles, which label Nos. 1, 2, and 3. In No. 1 bottle place the whites of four eggs, or a relative quantity of Thomas's dried albumen, which answers admirably, to which add four drachms of liquid ammonia; in No. 2 bottle five ounces of plain beer; in No. 3 bottle five ounces of beer and ten grains of pyrogallic acid.

Take a quarter-ounce of No. 1 and the same quantity of No. 2, which mix together, and then pour over the plate, on which allow it to remain half-a-minute. Then wash the plate under the tap for a quarter of a minute, after which apply half-an-ounce of solution No. 3, which allow to drain without washing the plate, and the latter will then be ready for the drying-box.

I now come to the development, which is the most important point of the process, and with which, I believe, many persons have failed, as I did myself when first trying this process. I was under the impression that considerable density could be obtained with the alkaline developer. This, however, is not so. Unlike an emulsion plate there are two stages of development, in the first of which, with the alkaline developer, only a very weak image is obtained when looked at by reflected light. Do not push this stage farther, but wash the plate under the tap. So far the bromide only in the film has been reduced, the iodide remaining unaltered. The iodide, however, is acted upon in the next stage of development, and density thereby acquired, although it will probably be found requisite to intensify with acid silver after fixing. Captain Abney explains the chemical action of the developer thus:—"The alkaline development produces a faint image by the reduction of the organic salt and bromide of silver to the suboxide of silver. The iodide is unattacked by it. The acid silver development utilises the exposed iodide thus:—The attraction of the suboxide for fresh silver (deposited by the acid development) is increased by the irritated oxide, and thus density is acquired."

The following are the developing solutions:—

No. 1.

| | |
|---|---|
| Pyrogallic acid | 12 grains. |
| Water | 1 ounce. |

No. 2.

| | |
|---|---|
| Liquor ammonia | 1 part. |
| Water | 4 parts. |

No. 3.

| | |
|---|---|
| Citric acid | 60 grains. |
| Glacial acetic acid | 30 minims. |
| Water | 1 ounce. |

No. 4.

| | |
|---|---|
| Nitrate of silver | 20 grains. |
| Water | 1 ounce. |

No bromide of potassium is required, as the trace of preservative left on the plate acts as a restrainer.

In developing first rinse the plate under the tap, then flood with half-an-ounce of pyro. solution No. 1, after which add to the same solution two drops of ammonia solution No. 2. When detail is feebly out wash the plate, and apply half-an-ounce of pyro. solution

No. 1 with six drops of acid solution No. 3. To the same solution afterwards add two or three drops of silver solution No. 4 until density is acquired. Wash and fix in a solution of hyposulphite of soda containing one ounce of soda to six ounces of water. It will probably be found necessary to intensify with pyro. and acid silver after fixing, with which any amount of density can be obtained.

I may here state that before the last application of acid silver in intensifying I flood the plate with a solution of iodine and potassium, which prevents stains and keeps the shadows bright. It is composed thus:—

| | |
|---|---|
| Iodine | 20 grains. |
| Iodide of potassium | 40 ,, |
| Water | 1 pint. |

So far as my experience goes these plates do not require any backing, the film being sufficiently opaque to prevent reflection.

You are, no doubt, aware that the recent scientific expeditions undertaken for observing the transit of Venus were supplied with plates made by this process. The results have been, I understand, in every way satisfactory.

I may also state that these plates are rapid. The negatives on the table were taken with an exposure of one minute in a comparatively dull light in the afternoon, the lens being Dallmeyer's whole-plate doublet with a half-inch stop.

I must say, in conclusion, that I can confirm all that Captain Abney has said in favour of the process, and I certainly prefer it to any other I have tried, both for reliability, perfection of result, and the comparative ease with which the plates can be prepared.

T. Clarke.

## EMULSION PROCESSES.

It is with reluctance that I say anything but in commendation of Mr. M. Carey Lea's contributions to your Journal. I have followed his experiments for years, and have had not infrequently to acknowledge indebtedness to him for his discoveries, especially in reference to emulsions. I have had occasion to say elsewhere that his employment of the mineral acids as restraining agents in the composition of emulsions containing free nitrate of silver was the step which made rapid emulsion plates first possible, and must in general say that his indefatigable researches into the value of substances applicable to photography have made his contributions to its chemistry of the first importance since Major Russell's discovery of the superior value of pure bromide for the dry processes.

But this said I must also express the opinion that the value of his directions has often been diminished by what seems to me (and proves so in practice) capricious complication of composition and manipulation, and needless introduction of substances apparently for the purpose of making the operations more difficult. I have been prevented by circumstances out of control from going over the experiment he records with chloriodo-bromide emulsion, but the analysis of his formula made me expect no better result than that recorded in your leading article of April 16th.

I must confess that I do not understand Mr. Lea's table of equivalents. He gives as the composition of his emulsion the following:—

| | |
|---|---|
| Cadmium bromide ("*dried*") | 8 grains. |
| Ammonium | 2½ ,, |
| ,, iodide | 2 ,, |
| *Aqua regia* | 2 drops. |
| Cupric chloride | 2 grains. |
| Silver nitrate | 24 or 25 ,, * |

Now, according to my chemistry, this formula would convert as follows:—

| | | | | |
|---|---|---|---|---|
| 8 grains | Cd. Br. | (at. wt. 136·) | ...10 | grains silver nitrate, |
| 2½ ,, | Am. Br. | ( ,, 98·) | ... 4·336 | ,, ,, ,, |
| 2 ,, | Am. Iod. | ( ,, 145·) | ... 4·343 | ,, ,, ,, |
| 1⅓ minim | H. Cl. | ( ,, 36·5) | ... 2·487 | ,, ,, ,, |
| 2 minims | Cup. Cl. | ( ,, 68·2) | ... 5· | ,, ,, ,, |
| | | | 26·166 | ,, ,, ,, |

*i.e.*, a deficit of silver nitrate of 1·166 grains in the case of twenty-five grains being used, or, in case of the *common* H. Cl. being used, the deficit would be reduced to less than one grain, the proportion of H. Cl. in common commercial acid being twenty-eight per cent. In this computation all the fractions beyond the third decimal are thrown away, while, on the other hand, H. Cl. being of sp. gr. 1·2 is treated as of equal weight with water to simplify calculation.

But in this shape Mr. Lea's discovery is nothing; for, as I wrote to you from America last year, Mr. Roche, Messrs. Anthony's operator, had made an emulsion containing an iodide which worked perfectly and admirably, and, with an excess of soluble haloids, emulsified better than plain bromide, but, if used wet, required a weak nitrate bath to convert the trace of soluble haloids. This emulsion made very good dry plates, but not so quick as pure bromide, if I remember rightly.

Perhaps my calculation of equivalents is wrong, but, if not, it is difficult to estimate Mr. Lea's formula, and we cannot attach great importance to his estimates of exposure as between bromide and "chloriodo-bromide;" but when he says that the latter has treble the sensitiveness of the former, and the Editors assure us that it is much less still than wet (The British Journal of Photography, April 16), we have a right to suppose that Mr. Lea's bromide emulsions must be slow. I have made working bromide emulsions which required only one-half longer exposure than wet collodion, and if these were a standard Mr. Lea's new plates would be twice as sensitive as wet collodion *containing the same ingredients*, which is contrary to all experience so far recorded. I am not rash enough to say that it is impossible, but that it requires nicer calculation than Mr. Lea seems to give to prove it.

I do not understand how Mr. Lea can insist on his tannin-albumen preservative in the face of the fact that the presence of the two is impossible in any filtered preservative. In his directions (The British Journal of Photography, March 12) he says, naively, that if the "fibrinous matter" in the mixture be allowed to settle the filtration is facilitated, which is very natural, since this "fibrinous matter" is the albumen coagulated by the action of the tannic acid, as has been shown repeatedly in The British Journal of Photography; but he pushes this too far when he advocates soaking the collodion pellicle prepared on Mr. Bolton's plan in an albumen preservative. I must say that I cannot fathom the philosophy of adding albumen, sugar, or gum to a pellicle which is to be thoroughly washed, dried, and then redissolved in alcohol and ether—solvents which will not retain a trace of either of these! Tannin and gallic acid I tried in the way Mr. Lea proposes more than a year ago, and found a slight advantage on the score of density in the use of the former, but at a decided loss of sensitiveness, and with a suitable quantity of pyroxyline there is no advantage on the score of density even in the use of tannin.

After countless experiments in the direction which Mr. Lea has now indicated I most confidently assert that, with a good quality of pyroxyline, greater sensitiveness (with *quite* sufficient density) can be obtained without any preservative than by either of Mr. Lea's expedients, with the advantage of greater softness, due to the fact that the secondary lights have not the same tendency to overtake the high lights that they have when tannin is employed.

Of all the substances Mr. Lea mentions tannin is the only one which retains its effect after the washing and re-solution; and a slight addition of tannin to the emulsion after re-solution has certain advantages over the use of it with the pellicle before drying, giving a closer and more vitreous film which has better keeping qualities.

It is of importance in such matters as emulsion photography to arrive at the simplest possible formulæ; and I cannot but express my opinion that Mr. Lea's complications seriously diminish the chance of success for the inexperienced. Mr. Bolton's improvement to the process which owes its first successful step to him is a boon of which I, who had been long experimenting in the same direction, must especially acknowledge the value, and I strongly deprecate any needless complication of it. Since the first publication of his process many persons have contributed to perfect it—notably Mr. Sayce, Mr. Lea, Mr. H. Cooper, Mr. Gough, and Colonel Wortley—but the process is substantially Mr. Bolton's; and I am glad to see that Mr. Lea awarded him due credit for at least one important step in it. What he claims as his process under the name of "chloro-bromide" is really unimportant, for I can produce as good results by the process in its extremest simplicity as can be obtained by any complication of it.

I have shown in your Journal that an emulsion may be kept with excess of silver nitrate for weeks by the addition of a trace of pure nitric acid, and that by dissolving the silver nitrate in the collodion first, and then the bromide, a most sensitive emulsion could be made without either chloride or nitric acid or excess of silver nitrate. Mr. Cooper showed, too, that equally good results were

* In reply to my strictures on this formula, it may be said that Mr. Lea has given another equivalent than that I have assumed for cadmium bromide, and that his drops of *aqua regia* are smaller than my calculation. But "dried" cadmium bromide is what I have taken it for, and what that sent me by Hopkin and Williams has always proved; while a chemist who talks of "drops" as a measure talks of an uncertainty, and is properly taken always to mean minims. It is quite possible that by using impure chemicals and insufficient measures Mr. Lea may make an excess of silver such as he states, but, strictly followed, his formula will not do so.—W. J. S.

obtainable with a chloride and no acid, and Colonel Wortley showed that the substitution of nitrate of uranium had even a greater restraining influence than *aqua regia;* but neither of these precautions, any more than Mr. Lea's acid, are necessary, as I am ready to show at any time by forming the emulsion by the solution of silver nitrate fifteen grains per ounce of collodion, then sufficient ammonium bromide to convert the whole of the nitrate, and then working by Mr. Bolton's directions without any preservative before or after re-solution. It is, therefore, useless for Mr. Lea to go on suggesting improvements which are only complications without any advantage, and which put the experimentalist out of the mood to try the process by the array of precautions to be taken to ensure success.

Now the fact is that nothing can be simpler than the emulsion process with bromides alone; nothing is quicker if the pyroxyline be of the proper kind and in the proper state; and Mr. Lea's new modification of it as stated by himself, with the light thrown on it by the leading article in The British Journal of Photography already alluded to, is only a complication without any advantage, for even that which at first sight seemed one—the freedom from halation—is quite as much a property of the pure bromide emulsion when made with sufficient silver nitrate or the requisite pyroxyline. With my own make of emulsion, using the quantity of silver Mr. Lea employs, there is no halation whatever, and none with the smaller proportion I generally use (fifteen grains), except in cases of long exposure with a great contrast, as in wood scenes, and for interiors where are lighted windows. I have this week obtained with an emulsion made from an American cotton (which gives a minimum of halation without backing) a fully-exposed negative in fifteen seconds, where ten seconds with a wet plate did not give so good detail in shadow, and fifteen only gave a very slight advantage. The difference in sensitiveness of this emulsion (or of any other really good) when used without any preservative, and when used after being soaked in a preservative and dried and redissolved, was markedly in favour of the former.

I have made over and over again the following comparative trials:—First: the same collodion prepared with *aqua regia* and bromide, and with *nitric acid* and bromide. Second: with nitric acid and bromide and excess of silver nitrate, *added after the bromide;* and without nitric acid or excess of silver nitrate, the *silver being added first,* and a bromide in excess being added to form the emulsion after two or three hours' solution of the silver nitrate. Third: with the emulsion prepared first with excess of silver nitrate and nitric acid, and (after keeping several weeks) conversion by a marked excess of bromide; and the same used newly with excess of silver nitrate.

In the first I could find no invariable advantage in either method, the difference, where there was any, being sometimes in favour of one and sometimes of the other. Using cadmium bromide there seems a very slight advantage in the use of H Cl, but with ammonium the reverse. I prefer, on the whole, not to use the H Cl, but nitric simply. In the second the results varied again with the time of keeping before final conversion, the difference, when there was any, being slight. In the third, and using a sample of Mr. Gordon's papyroxyline, I made the quickest workable emulsion I have ever seen (except gelatine), which had two grains of bromide of ammonium in excess when finished. With Rouch's cotton I made one which gave me all the detail in three seconds which I could get in five with wet collodion, but not density enough to be of any value. This emulsion was unaffected when exposed to the sun for hours, but washed quickly, and was always more rapid than the newly-made—generally twice as rapid. In comparative trials with plates prepared by Mr. Lea's formula and his cochineal preservative I found mine about one-third quicker when used with gum ammoniac and no preservative coating.

In these experiments I showed that the chloride was of no use except when the bromide was one which, like cadmium, produced a coarse silver bromide, and that nitric acid with ammonium bromide was better; that excess of nitrate of silver in the emulsion was not a necessary condition of success, but that a bromide of silver formed in presence of an excess of silver nitrate had a greater sensitiveness than one formed in presence of excess of the soluble bromide, and that it did not lose this sensitiveness by the subsequent addition of a soluble bromide; and that the physical condition of the pyroxyline induced by the action of the excess of silver nitrate aided in the direction of sensitiveness but diminished the density, unless the pyroxyline were of a peculiar quality which is not obtainable commercially.

Although, therefore, in my own best results I have used none of Mr. Lea's discoveries—neither chloride nor nitric acid, neither excess of silver nitrate nor preservative of any kind, and am thus practically indebted to him for nothing in those results—I must acknowledge that to his success in first enabling us to use any excess of silver nitrate I am indebted to him for being put in the way to success based on simpler and more efficient expedients. It was not the use of one or two grains' excess of silver nitrate, but the use of mineral acids, which Mr. Lea should, in my opinion, claim his honours for, and this no one, so far as I know, can dispute with him.

But I am sorry to see that while simplicity is so important a desideratum in this process, and while I have shown that it is attainable in a remarkable degree, Mr. Lea goes on introducing complications and making modifications absolutely useless, and that while he is sensitive to a curious degree about the credit given to him, he observes the most studied silence with regard to the labours and results of everybody else. He would lose nothing of his own credit by seeing and acknowledging the results accomplished by others. As Mr. Bolton's process now stands—and in its best form it owes absolutely nothing to Mr. Lea—yet he generously accords to Mr. Bolton "a most ingenious idea" which "solved one part of the problem," and goes on to solve the rest of it, blind to the fact that the whole thing has been already done, and that plates have been prepared by the process worked in extreme simplicity, which (judging by trials by competent experimentalists of my acquaintance) considerably surpass those to be produced by Mr. Lea's new process. W. J. Stillman.

P.S.—Since writing the above I have received The British Journal of Photography for April 23, containing the results of the editorial trials of Mr. Lea's new process, which are what I expected.—W. J. S.

## ON BLURRING.

So much has been already written on this subject that it may almost be deemed exhausted; and yet, in spite of our knowledge of the causes of the defect and of its remedies, we appear to be as far off a satisfactory solution of the question as we were ten years ago. That the operation of painting the back of the plate with non-actinic pigment is simple in the extreme, and at the same time effectual in result, except under trying circumstances, there cannot be a doubt; still it is undeniable that this part of the process of preparing dry plates is looked upon by many amateurs as the most unpleasant of all.

The method of staining the film, as recommended a few years ago, is viewed with even less favour apparently, owing to the undoubted loss of sensitiveness in the first place, and also to the uncertain nature of the substances introduced into the collodion or emulsion for the purpose of producing the desired colour. Many other plans have been suggested and tried with more or less success, but none have been found to approach the two mentioned in general efficiency. One plan, which I was surprised to see advanced in these columns not many weeks ago, may be taken as a sample of the utility of the majority of the suggestions made. I refer to the employment of coloured paper in the dark slide. This, I need scarcely say, is of as much use, unless means be taken to secure optical contact with the reverse side of the plate, as "nothing at all," yet I do not for one moment doubt that the gentleman who recommended it had found it efficacious.

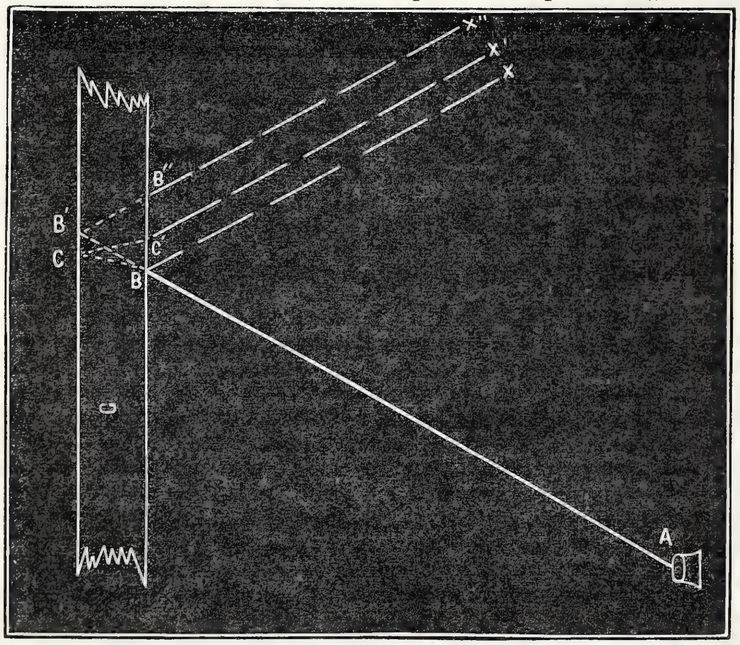
It appears to be supposed by many that blurring is a necessary evil in connection with all dry plates, and with some classes of subjects this is no doubt the case; but many others—I might, perhaps, say the majority of subjects met with in the course of a season's work—show little or no tendency to blurring, and may be rendered perfectly without recourse to any anti-blurring treatment. In such cases the yellow paper backing will prove quite sufficient for every purpose; but to employ it in photographing interiors or views including great contrasts of light and shade in juxtaposition would be but to expose its utter inefficiency. I have frequently had shown to me proofs from dry-plate negatives, and have been asked to notice their freedom from blurring, when, in reality, perhaps not one out of ten of the subjects would be liable to the defect under any circumstances.

I have been led to make these remarks by noticing a growing desire on the part of photographers of the present day to dispense with all anti-blurring treatment, and I wish to consider now how far it may be possible to do this. I may premise that for some subjects—such as dark interiors—I believe it will always be found necessary to take precautions for the prevention of this fault, even when working the wet process, which is infinitely less liable to it than the majority of dry ones. Without entering fully into the

various theories which have been advanced at different times explaining the causes of blurring, and passing over the numerous different species of the evil which have been recognised and named, I may consider the more common phases under which it is found in connection with dry-plate landscape work.

I may place first "blurring" proper—the defect commonly supposed to be caused by the reflection from the interior of the back surface of the plate of the rays of light which have acted upon and passed through the sensitive film. This form shows itself with more or less distinctness according to the density of the film and the nature of the subject, usually exhibiting an appearance of indistinctness or "fuzziness" in the lines of the picture as if from want of care in focussing. In the worst cases, however, when working with very thin, transparent films, it may assume the form of a distinctly-double outline.

The explanation of this is simple enough. The rays of light, after passing through the film, enter the glass, and, striking the back surface, are partially reflected internally upon the back of the collodion. But this reflection does not take place in a direction perpendicular to the surfaces of the glass, otherwise the only effect produced would be an advantage rather than the reverse. The various pencils proceeding from the lens strike the plate at an angle more or less acute, according to their distance from the centre, and by the well-known law are reflected at an equal angle in the opposite direction. But in passing through the glass the pencil suffers refraction—that is, is bent out of its previous course—falling upon the internal surface at a more obtuse angle than it does upon the front. The accompanying diagram will explain my meaning better than any words I can employ:—The pencil A B, proceeding from a




point A, strikes the exterior surface of the plate C at the point B, and is reflected to the direction of X. If it pursued its course in the same straight line it would strike the internal surface at B′, and be reflected in the direction X″, meeting the front surface at B″; but on passing into the glass it takes a new course, B C falling upon the back surface at C, and, suffering reflection at the same angle, it strikes the front surface at C′. I have purposely exaggerated the thickness of the glass plate in order the more distinctly to trace the course of the pencil; but it will be seen from the diagram that so small a matter as the thickness of the glass used may have a great influence on the amount of blurring, as the thicker the glass the greater will be the distance between the points B and C′—that is to say, between the points where the primary and secondary images are formed.

For the sake of clearness I have omitted all mention of the absorptive power of the glass, and also the diffusion which must occur before the pencil of light reaches the back of the film. These latter depend to a very great extent on the thickness and quality of the glass used, and possibly also on the strength of the light.

To prevent this form of blurring it is obvious that the only requirement is to destroy the reflection. This is done by placing in *optical* contact with the back reflecting surface a non-actinic pigment or other substance; the rays of light then pass entirely through the glass and are absorbed by the backing. It must be quite evident to all that, unless the backing be in optical contact with the glass, the reflecting surface of the latter still exists, and the only light absorbed by the pigment is that portion which must pass through the plate under any circumstances, and which produces no ill effect whatever.

The second form of blurring I shall notice is one which has been variously named "halation" and "internal radiation." This is supposed to arise from—and I see no reason to doubt the theory—the reflection of the light from the particles of bromide or other haloid of silver contained in the film. If we can imagine a transparent film formed of particles so fine as to obstruct no light at all, then we may consider that we shall be free from halation; but, as a matter of fact, the particles of iodide and bromide as usually found in sensitive films are sufficiently coarse to exhibit a very granular appearance under a moderately-powerful microscope. These particles obstruct the light as it passes through the film and divert from its course that portion which is not absorbed. This reflected light strikes in all directions, and it depends upon the density of the film how far its power is exercised. To combat this evil the only plan is to use films which possess naturally great density or are artificially coloured, when the defect will be localised or, perhaps, destroyed altogther.

In writing upon a subject such as the present it becomes absolutely necessary to exaggerate, or at least give greater emphasis, to the evil complained of than is usually found to be the case in practice. Without denying the existence of blurring I must say I think its annoyance is much over-rated. It is only of late years that it has become so generally recognised, and it is only of late years also that bromide alone has been used in the preparation of dry plates. These facts combined point distinctly to the desirability of re-introducing the iodide into favour, if it can be done without any counterbalancing disadvantages. The great object appears to be to obtain a dense film of a non-actinic colour, and this is fully attained by the use of iodide as pointed out, for the first time I believe, by Major Russell. The only question remaining is how will the iodide affect the sensitiveness? Mr. M. Carey Lea tells us that we have an absolute gain in sensitiveness from its use, together with other minor advantages. Why, then, adhere to the old and messy backing or any other artificial method of procedure? W. B. Bolton.

## NOTES ON PASSING EVENTS.

By a Peripatetic Photographer.

A leading character in *Valentine Vox*, a native of the quondam sister kingdom, or "ancient principality," of Wales, when expressing his opinion of the fermented malt liquor of the period, poetically gave it as his opinion that there was no drink in existence like "peautiful peer." From the "ages ago" since malt infusion, both fermented and unfermented, was first pressed into the service of photography as a preservative for dry collodion plates, so much has been written on this much-appreciated "wine of malt" that one is rather apt to get confused in even thinking about it. There appears to be an intoxicating, befuddling, and bemuddling influence in even the very name. One man—a mere nobody—suggested what is known as "wort" as a preservative, and did not get so much as thanks for his pains; another who followed on the same tack was more fortunate, and got a medal; a third expressed his preference for strong ale, a fourth for bitter ale, a fifth for stout or porter, a sixth for ale with a little albumen mixed with it, a seventh for ale and albumen in a proportion different from the previous one mixed with it; and for each and all strong claims to be admitted to the honour of discovery are made by friends and partisans of the respective "discoverers." I, among others, have long desired to achieve something of an undying character—some meritorious invention—by which *my* name, too, might modestly claim to be enrolled in the book of fame; and, congratulate me! I have at length made the grand discovery—a new process is about to be divulged for the first time! Circumstances into which I need not here enter led to my presence at the bar of the "Blue Boar." I gave a discriminating glance at all the stimulating compounds which were being presented to longing eyes; but, alas! in the wide domain of photography there were no more worlds to conquer. Ale (sweet and bitter), beer, stout, porter, gin and water, even raspberry vinegar—all, all had already been pressed *bon gré, mal gré* into the service of the "art-science." It was enough to make one weep; but, suddenly, my rescuer from the scientific dilemma entered the bar in the person of a burley carter, who called for a pot of "'alf-and-'alf." Would it be a cause of wonder were I to spring forward to embrace the being who, although already redolent of his favourite beverage, had proved a *tirer d'affaire*, and secured distinction for your monthly contributor? Here, then, is my discovery—plates may be preserved by means of that curious admixture of little-known fluids popularly known as "half-and-half."

Let no reader think slightingly of my great invention, for it is *quite as original and quite as valuable as several others which have been both be-praised and be-medalled.* To save others from snatching away my laurels I beg to say that "I do not adhere to the exact proportions here indicated, but claim as my invention the mixture of the two liquids in any proportions." *Verb. sap.*

There was a remark made at the last meeting of the West Riding of Yorkshire Photographic Society which deserves notice. That remark, made by Mr. Wormald, was to the effect that it would be desirable if some one would undertake the making of reliefs for the Woodbury printing process. Now, it is a well-recognised fact that in the preparation of printing-plates for this process none of the various methods of effecting this equal in cheapness and efficiency the one so happily thought of by Mr. Woodbury, in which, by means of hydraulic power, the image on the gelatine relief is impressed in the metal plate, which by this operation becomes a printing surface. And now that the process is no longer hampered by patent restrictions, nothing but the enormous price of a hydraulic press and the flat steel plates required in connection therewith prevents the process from becoming far more generally adopted than it is. If some enterprising firm would purchase the necessary press and fittings, and lay themselves out for preparing and supplying leaden printing-plates to any one who would send a negative or a gelatine relief for that purpose, a large and remunerative business would be the result. In the event of the gelatine relief being supplied by the photographer the whole expenditure of time involved would be three or four minutes, and members of the fraternity would not grudge paying handsomely for the privilege. The foundation of a lucrative business would thus be laid most certainly. Who will be first in the field to supply the want?

If Dr. John Nicol—who writes concerning a "little thing" that requires attention, viz., the developing glass—would adopt my advice he might obtain one at a marvellously cheap rate, and which would fulfil the conditions laid down by him—"freedom from corners at the bottom, and a slightly bell-shaped mouth." Let him step to the nearest porcelain warehouse or crockery store and invest twopence in a white porcelain egg-cup. The conditions are perfect; the mouth (by selection) is bell-shaped, and the bottom is rounded, added to which are the following advantages:—The colour is white, allowing of any particles of dirt or deposit being seen with ease; the shape is convenient for standing with solidity; and the quantity that one of these useful little vessels will hold is quite enough for small plates or anything up to $10 \times 8$. I have for several years used this kind of developing dish exclusively for plates under the above size, and can recommend it very strongly.

I do not know anything more likely to prove an inestimable boon to the instantaneous photographer than the plano-concave corrector of Professor Piazzi Smyth. Everyone now knows that if a portrait combination be corrected so as to transmit the oblique rays to a *sharp* focus, that focus falls on a plane rather nearer to the lens than the focus of the central rays, and hence to obtain a perfectly-sharp image with a lens of this description a hollow plate is required. But hollow plates are very inconvenient and to a certain extent impracticable, and therefore the lens must be corrected so as to cover flat, by which its marginal definition becomes impaired. The idea of interposing a plano-concave lens between the objective and the sensitive plate and close up to the latter is a most excellent one; for, while the central rays will not be much interfered with, the marginal ones are, as a matter of necessity, lengthened out and come to a focus on the same plane as those transmitted axially through the lens, and this, so far as I can see (for I have only yet traced the course of the rays on paper), without the marginal rays coming to a focus in such a disjointed state as if they were the victims of astigmation. The principle is sound, and the result in practice ought to be invaluable.

A short time since I had occasion to re-glaze the windows of my dark room. I wished to have a flashed ruby glass matched, and for this purpose I applied to one of our most eminent London firms, who, unable to match the sample, supplied me with a pot orange glass of a decidedly yellower tint than the ruby sample. The point to be noticed is this—the orange glass supplied stops actinic light quite as well as the ruby, and my tentative experiments were conducted with bromised films. It is true, however, that neither the direct rays of the sun nor any very strong light has access to my window.

Did Colonel Stuart Wortley act wisely in penning what some consider an insult to photographers, when he says "more distinction is to be gained nowadays by simply taking what another has previously published, and writing a long article, ignoring the previous worker?" Quite apart from the wisdom of such a course in the writer, it has a certain amount of comicality associated with it, seeing that in the very same and subsequent numbers of the Journal Mr. M. Carey Lea has been dealing out blows to Colonel Wortley, with no sparing hand, for having himself done that which the latter gentleman so graphically charges against others in the quotation above given. There is more acumen possessed by the fraternity than Colonel Wortley gives them credit for. It is not the man who writes either one long or many short articles upon what another has previously published who ultimately gains distinction in the eyes of his fellows; but it is the man who grasps a new principle, makes new and practical suggestions, works patiently at new or modified processes, and then freely publishes the result of his labours to his brethren without restriction or reward. Such is the person photographers delight to honour. This line of thought suggests the fact that there are probably many who would be pleased to find Colonel Wortley following the example so recently set by Mr. Lea, by publishing, *pro bono publico*, such details, connected with the preparation of uranium dry plates, as would enable photographers possessing an average amount of skill to prepare for themselves plates of the same alleged quality as some issued by the firm with which the former gentleman was till lately connected.

The method of enlarging published by Mr. Blanchard at the last meeting of the London Photographic Society will, whether it be new or old, prove to be a very handy one. I overheard a suggestion to the effect that it was the same as Sarony's (no longer) secret process of enlarging, but this is incorrect. It is true that in both methods an enlarged glass transparency is obtained from the original negative; but in Sarony's process that transparency is employed to produce a collodion negative on glass by the camera, whereas in Blanchard's the transparency is employed in printing upon ordinary sensitive paper in the printing-frame, the resulting picture being a paper negative capable of being used, in turn, in the production of ordinary prints. I see a great deal in the Blanchard method to induce me to be pleased with it; and this satisfaction is not likely to be in the least degree lessened by the fact that the first and as yet only picture I have enlarged by the method has proved very successful.

A sly fellow is Mr. J. R. Sawyer! He knows how to touch us on the "raw." "Can anything," he asks, "be more disheartening than to look through a costly album or scrap-book containing silver prints which have been in existence only half-a-dozen years (portraits of friends, perhaps passed away for ever) but are yellow, faded—the mere ghosts of what were once satisfactory mementoes, views of places and objects which served to call up pleasant memories?" I quote this for the sake of endorsing the sentiment most heartily. Verily it *is* disheartening to look through such a collection; and I have many times felt exceedingly "disheartened" at the result. Of course the "balm in Gilead" suggested by Mr. Sawyer savours of the grand principle enunciated by the cobbler—"nothing like leather." A member of the leading carbon printing firm, his panacea is—*carbon*. Under some circumstances the recommendation might seem redolent of the "shop;" but in this case it is only too evident that pigment printing is the sole specific. Every move made in the furtherance of this mode of printing must be greeted approvingly; and it is in this light I regard the recent improvements in the mode of transferring introduced by the gentleman named.

I observe in that repertory of hints, banter, advice, suggestions, and downright useful information—the column of "Answers to Correspondents"—that the Editors have given to "G. P. P." some information concerning the best methods of increasing the strength of alcohol without having recourse to distillation or other troublesome means. The information is most excellent so far as it goes; but it ought to go a little further, and apprise both the querist and general reader that experiments of the kind indicated should be confined to ordinary alcohol; for when methylated spirits of wine forms the subject of slight attempts at strengthening or rectifying, the Excise is immediately on the scent. If *I* were to shake up a little carbonate of potash with my methylated spirit, or were to amuse myself in removing its offensive smell by the aid either of tallow-soap or of freshly-burnt pulverised charcoal, depend upon it *I* would not invite an officer of Excise to be present to watch the simple operation.

At last the art-union drawing in connection with the Photographers' Benevolent Association has taken place. The delay was irritating. To prevent such a hitch another year would it not be legal to have the drawing made at some place on the continent, and

the result then communicated here? I do not imagine that it would be illegal, and it would save a great deal of worry and anxiety to those who bestir themselves in the movement.

Commend me to French ingenuity! A Parisian brother has invented a method for giving the proper expression to the face of his sitter, so as to turn him "from grave to gay, from lively to severe." It consists of an apparatus in which is a square hole, at which is made to appear, by means of clockwork, *carte* portraits either comic or sad, to suit the requirements of each case. If a man look peculiarly heavy and "glum" he is to be treated to a peep at some charming young damsel with

"A smile that glows
Celestial rosy red, love's proper hue"

—one which it is presumed will soothe his sorrows and induce a look of "bright tranquillity" upon a care-worn countenance. On the other hand, if his spirits are too jubilant and an excess of gaiety appear to ooze out of every facial lineament, this exuberance is checked by similar means. "*Similia similibus curantur*," says the homœopathist; but the opposite doctrine prevails here. If any London photographer is annoyed by a too-delighted expression on the face of his sitter, all he has to do is to exhibit to his gaze, by clockwork or otherwise, the significant compound word "May-Day," and suggest to him to exercise his memory on the deplorable weather with which the "merrie month" was ushered in this year; and if that do not scare away the all too pleasant expression suffusing his countenance it is simply because he has no feelings in particular. But, for all that, "Now is the Month of Maying," and Nature invites all who possess a camera to go out and woo her, when to the enthusiast her

"Silent things
Are breathing the deep beauty of the world."

## FOREIGN NOTES AND NEWS.

### A Dead Varnish Retouching Surface.—Experiments with Iron Developing Solutions.

The following observations on retouching surfaces are taken from an article on dead varnishes, by Fraulein Antonie Bogner, in the current number of the *Photographische Correspondenz*.

It is well known that of all coverings for the picture film the most delicate and equal is that produced by pouring raw collodion, coloured with fuchsine, over the plate. But this coating, though it may allow of the blemishes in the deepest shadows being improved, allows of no meddling with the lights; it is sufficient, however, for some weakly-covered but otherwise good negatives, only they require to be very carefully handled by the printer lest the easily-damaged collodion film should be injured. A more useful coating for retouching upon is produced by adding tartaric acid to ordinary negative varnish, which, after the mixture has stood for several days and been repeatedly shaken, may be poured over the glass side of the negative like fuchsine collodion. This somewhat coarse varnish forms a colourless, dead, tough, and durable film, which can be freely drawn upon. It allows patching up of the lights and modification of the too-powerful action of the light; and, lastly, neither from the retoucher nor from the printer does it demand very delicate handling. The greatest drawback to the use of this varnish is that the negative varnish of the shops does not always give the same result. Sometimes the varnished surface dries in ridges or waves; this is caused by the presence of shellac. Sometimes the varnish film seems covered with hoar frost, and when this rime is wiped off the surface below it is clear and glancing. Yet, in most cases, good results are obtained with the negative varnish, and almost invariably with that of the firm of A. Moll.

But the best and surest results Fraulein Bogner obtained were got by a mixture of raw collodion with commercial amber varnish, in which the raw collodion is thinned by the addition of ether and alcohol in equal parts to a consistency of three per cent., and as much amber varnish dropped in as causes the mixture to become somewhat darker than olive oil. It is impossible to give exact weight or proportion for this mixture, as the consistency of the commercial amber varnish is very variable. The mixture should be shaken up and filtered through cotton-wool, and, when used, poured over the plate like pure collodion.

This varnish, when first applied, gives a thick, milky, and not very promising-looking film; but during the drying this dead film becomes so pure and fine, and, above all, of so perfectly equal a surface, that one is astonished that such a result could be obtained with ordinary glass either by mechanical or chemical means. About a quarter of an hour after the application of the varnish, in an ordinary temperature, the surface will be dry enough to admit of being drawn upon with a little care. Let it, however, become completely dry—which it becomes sooner than the ordinary varnish—and it will offer to the pencil a surface as firm as graphite, and that without any roughnesses to cause coarse or undefined strokes. It also allows of stopping-out, and it is self-evident that it withstands the influence of damp, and that from its toughness the film is not imperilled by printing.

In trying to colour this varnish—which ought to be necessary in few cases—Fraulein Bogner has not been quite so succcessful as she could wish, but has obtained passable results with dragon's blood. The tar colours from which she hoped most did not go well with the varnish. Fuchsine, in combination with amber, shellac, and other resins, becomes an ugly lavender-blue which has partially lost its light-arresting power. Coralline appears to exercise a detrimental influence on the tone of the prints; and aniline blue should be avoided on account of its capricious variation and its known retention of the actinic rays of light. There remains, therefore, only violet and green, or a combination colour or some vegetable colour, to be tried.

This varnish, combined with bluish tar colour, can be used for the panes of the retouching desk, which is employed to preserve the sight of retouchers who have weak eyes. For negatives of larger dimensions, which require a strong covering, fine paper may be used, differing in thickness with the amount of light it is considered advisable to allow to penetrate the picture, from tissue paper, French paper, vegetable paper, even to writing paper. This paper is fastened to the wrong side of the negative in the same way as drawing-paper is stretched upon a drawing-board; that is, the paper is made quite wet, which causes it to draw out to rather more than its original size, and the edge is pasted firmly to the border of the picture. In drying, the paper shrinks together again and presents a smooth surface. In order to make the paper transparent wash it over with a fine brush dipped in Haarlem glue that has been thinned with alcohol. The high lights can be covered with graphite or with colour, and the modelling completely preserved. The work is somewhat tiresome, but the certain and beautiful result repays the labour.

A report was laid before the last meeting of the grand section of the *Association Belge de la Photographie*, by MM. Rottier and Waldack, who have been engaged in a series of experiments with the object of deciding upon the best substances to introduce into developing solutions having for their basis ferrous salts, also to determine the most suitable salt to use, and how far the result is governed by the strength of the solution. A large number of comparative experiments were made, the usual means being employed to secure absolute identity of treatment in every respect except development, the following points receiving special notice:—First: strength of iron solution. Second: nature of acid employed. Third: nature of salt of iron employed. With respect to strength it was found that a weak developer gives thin transparent images of a violet colour, which develope very slowly; and a stronger solution quickly produces vigorous results of considerable opacity. Also, that in the former case the image is formed throughout the whole thickness of the film, while in the latter it is almost entirely on the surface. These effects appear to increase with the strength of the solution up to a certain point, when a reverse action commences. The nature of the deposit is influenced not only by the strength of the solution, but also by the manner of its application, a different result being produced by rocking the plate from that obtained by keeping the developer in repose. These results refer to plain solutions of the protosulphate without acid.

In addition to the retarding influences of all acids the following are the peculiarities said to be exhibited by the different varieties used in these experiments:—Organic acids, with the exception of acetic, give generally a black metallic deposit. Acetic, on the contrary, gives a very pure image, fully justifying the support accorded to it by photographers generally. Sulphurous acid gave a result of no value whatever, while sulphuric proved to be in no way inferior to acetic. In all cases feebleness of image resulted from an increase in the quantity of acid used. Of the different salts used the following is the order in which they are placed as regards vigour and beauty of result, each being an improvement on the preceding:—Nitrate of iron; protosulphate of iron; a mixture of equivalents of protosulphate of iron and sulphate of copper; sulphate of iron and ammonia; acetate of iron. The last named, in addition to other qualities, required less exposure than any of the others. The whole of the report has not yet been made public.

# Meetings of Societies.

## MEETINGS OF SOCIETIES FOR NEXT WEEK.

| Date of Meeting. | Name of Society. | Place of Meeting. |
|---|---|---|
| May 11 ........ | London ........................ | 9, Conduit-street, Regent-street. |
| ,, 13 ........ | South London .................. | John-street, Adelphi. |
| ,, 13 ........ | Manchester .................... | Memorial Hall, Albert square. |

## LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The monthly meeting of this Association was held at the Free Public Library, William Brown-street, on Tuesday, the 26th ult.,—Mr. W. Atkins, Vice-President, in the chair.

The minutes of the former meeting were read and confirmed, and Mr. E. Twigge and Mr. Ed. Whalley were elected members of the Association.

Votes of thanks were unanimously passed to Mr. F. York, Mr. C. Dawson, and Mr. Knott, the success of the lantern exhibition at the popular meeting being mainly due to their contributions and assistance.

A number of Mr. F. York's lantern slides were handed round, the subjects being very amusing—groups of children, &c., taken from life. The Secretary recommended the members to try and produce similar pictures. The ingenuity to be displayed in grouping, combined with their novelty and character, would render them more interesting than the usual photographic work.

Mr. Thomas Clarke then read a paper on *The Beer and Albumen Process.* [See page 221.] The paper was illustrated by several whole-plate negatives and transparencies, showing the excellence of the process. A vote of thanks was afterwards passed to Mr. Clarke for his paper.

The Rev. G. J. Banner exhibited three of Burgess's gelatine plates which he had exposed and developed that morning. He had had them for two years, and they showed their keeping qualities by developing perfectly clean and well.

The Rev. H. J. Palmer said that, finding he could not get intensity with the *rapid* plates prepared by Mr. Kennett's gelatine emulsion, he had written to Mr. Willis, of Scarborough (who had been so successful in taking interiors with them) asking him if he would object to give his method of development for the benefit of the members. Mr. Willis kindly replied, stating that he found no difficulty in getting any intensity provided that the plates were first placed for five minutes in a solution of twenty-five grains of bromide of ammonium to a pint of water, and afterwards in plain water previous to development. He (Mr. Palmer) found Mr. Willis to be right, and he would strongly advise the members to try the process, which was a very easy one when mastered.

Mr. Atkins showed two stereoscopic transparencies mounted with glass coated with the varnish-collodion opal backing. There was one drawback with them—the transparencies had to be reversed, or the picture had to be looked at through the backing. He (Mr. Atkins) said he had no difficulty in obtaining an even film if the mixture were well filtered and the glass free from dust.

The Rev. H. J. Palmer exhibited and explained the method of working one of Mr. Edwards's graphogenic cameras, which he (Mr. Palmer) afterwards presented to the Society, and for which he received a hearty vote of thanks.

It was decided that there should be an excursion to Lymm on Wednesday, the 12th inst., and the meeting shortly afterwards adjourned.

Photography in the "Morning Land."—The Marquis and Marchioness of Bute—who will probably be accompanied by the Marquis of Ripon—are about to start for the Holy Land. They are taking a photographer with them.

Fire at a Photographic Studio.—On Friday evening last, between eight and nine o'clock, a serious fire happened on the premises of Messrs. Hills and Saunders, photographers, in Porchester-terrace, Hyde-park. A large studio on the ground floor, 35 feet square, with its valuable contents, was burnt out, and the rest of the building was severely injured. An adjoining house, occupied by Mr. Basil Mélas, sustained considerable damage. The origin of the disaster is unknown.

Exhibition of Photographs at Reading.—Through the kindness of the Recorder of Reading (Mr. J. O. Griffits) an exhibition of photographs of statues and works of art, ancient Roman and Grecian buildings, &c., was last week held in the Town Hall, Reading. The collection was a large and choice one, and comprised many photographs seldom put within the observation of the working classes of that town, for whose benefit chiefly the exhibition has been opened. The admission each day was free. To make the exhibition more attractive Mr. Strickland and other gentlemen have given performances on the organ, and vocal music has been given by gentlemen of the Chapel Royal, thus holding out a further inducement to visit this really fine collection. The whole of the expenses have been borne by Mr. J. O. Griffits.

How to Earn Two Shillings and Sixpence per Hour.—At Northampton County Police Court, on Saturday, George Cooper, a photographer's assistant, at Northampton, was charged with obtaining money by false pretences. In consequence of the attention of the police being called to an advertisement inquiries were made at Hardingstone, a little village about one mile from Northampton, for a firm styling itself Davis Brothers. No such firm was known, but it was ascertained that a young man had called at the postoffice for letters addressed to that name, and had actually received forty-eight letters. From information received two constables were placed on the watch, and an arrangement made with the postmaster if any one called to let them know. On Monday evening, about eight o'clock, the defendant made his appearance, and received six letters and two post-cards. He was then followed to the town of Northampton, and there one of the constables, who was in plain clothes, stopped him, and asked him if his name was Davis. He said "No." He then asked him if he was in any way connected with the firm of Davis Brothers; he at first said "I am not," but on the constable telling him who he was, and that he would be detained, he then said he was an agent for Davis Brothers, but he would not say where they carried on business. He also said his own name was George Cooper, and that he was in the employ of a photographer of Northampton. The letters found on him were from people asking for samples and instructions, and enclosing one shilling's worth of stamps. They had also since ascertained that there were upwards of three hundred letters at the postoffice addressed to Davis Brothers. The document called the "instructions" showed that the whole affair was a deliberate swindle, and the paper sent as samples is not used at all in the art of photography. Besides the prisoner was not in a position to give permanent employment to any one, as he was only in the employ of a photographer in the town. By the advertisement he promised to give 8d. per dozen, when the paper used for *cartes de visite* cost 6d. per sheet, enough to make three dozen such slips as were sent in return for the twelve stamps. The following is a copy of the advertisement:—"Two-and-sixpence per hour easily earned by beginners (either sex), by preparing *carte-de-visite* papers at their own homes, at 8d. per dozen. Employment permanent. Trial packet and instructions, 1s.—Davis Brothers, Hardingstone, Northampton." The instructions told those who were induced to send the twelve stamps to apply the white of a new laid egg with the fore finger to the paper, and if properly laid on 8d. would be paid for each dozen pieces. The case was then remanded for a week in order to produce evidence from London. The accused was admitted to bail in two sureties of £50 each.—*Standard.*

## EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at the small cost of one shilling in our advertising pages. This column is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

Will exchange a lock-stitch sewing machine, very good, or other articles, for a quick lens with camera.—Address, D. Andrews, Wincham, Chard.

Voigtlander's three and a-quarter portrait lens, No. 5,487, as good as new, will be exchanged for a good card lens, by Ross or Dallmeyer.—Address, J. Bulmer, Postoffice, Brora, N.B.

A 10 × 8 Kinnear camera, mahogany, panelled, swing-back, rising front, &c., &c., never used, offered for a *carte* lens by a good maker; also a 12 × 10 Kinnear camera of similar kind, never used, offered for a harmonium.—Address, B. C., Drogheda.

I will exchange a good French *carte* lens, and half-plate mahogany bellows folding base camera, with one double and one single back and two fronts, for a Ross's $8\frac{1}{2} \times 6\frac{1}{2}$ medium angle doublet; or above and cash for $8\frac{1}{2} \times 6\frac{1}{2}$ symmetrical.—Address, A. Slater, Stoke-upon-Trent.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

Photographs Registered.—

W. O'Grady, Dublin.—*Photograph entitled "Erin in Hope."*

O. C. Smith, Stroud.—*Portrait of Mr. S. Stephens Marling, M.P.*

Frank W. Micklethwaite, Newry,—*Two Views of the Grave of John Mitchell.*

John Garratt, Dewsbury.—*Group of Ladies forming "Weaver's Executive Committee."*

John Horsburgh, Edinburgh.—*Portraits of Mr. Walter Bentley in the characters respectively of "Hamlet" and "Sir Archer Macsarcasm."*

W. A. Smith.—Received.

W. T. Watson.—We shall institute a search.

J. S.—The red tint on the picture arises from reduced gold.

S. Hercus.—We strongly disapprove of an excess of alcohol in the developer, for such excess will produce the very irregularity to cure which it was originally introduced.

J. M'Dermid.—By favouring us with a drawing of your proposed arrangement we shall be better able to comprehend it.

Delta.—The fullest account of the tannin process ever published is to be found in Major Russell's manual, *The Tannin Process.*

L. A. B.—Unless you can manage to alter the position of your studio we advise you to cover up the south-west side with blinds.

X. Y. Z.—Either a No. 3 or No. 4 will answer your purpose; we recommend you to select the latter, which will suit your camera quite well.

Robert Bridgart.—The form known as the "Herschel condenser," consisting of a meniscus and a biconvex lens, is the better of the two.

W. S. Peters.—The chloride of silver can be reduced to the metallic state by stirring it up with water to which a little sulphuric acid has been added, and immersing a plate of zinc.

G. B. B.—Proceed as for an ordinary transparency, using a rather old and thin collodion, developing with iron. But you will find a dry process much more manageable.

J. Jones.—We can scarcely offer advice respecting the best lens to employ; but it should be one that does not distort, works with a pretty large aperture, and does not exceed nine inches in focus.

Abel Lewis.—Thanks for the charming specimens of your imperial portraits We have laid them on our table for the examination of friends and visitors. We feel convinced that they will be highly appreciated.

Beginner.—Nitrate of silver can be prepared by dissolving silver coin in nitric acid made slightly warm. The presence of the copper with which the coin is alloyed will not interfere with its usefulness for your purpose.

Lanark.—A correspondent from Lanark, whose name we cannot decipher, is informed that by forwarding the photograph, with full particulars and eighteen stamps, to the Publisher his wishes will receive due attention.

W. Washam.—Nothing surpasses shellac varnish for protecting the wood work from the action of nitrate of silver and other solutions. A note addressed to Mr. George Hare, Lower Calthorpe-street, London, will procure you the information relative to the other matter.

Interested One.—We cannot give our readers any plainer information concerning the patent in question than we have already done. If you will only read the article we specially devoted to it you will there find a statement, couched in language such as even the most obtuse brain could not misunderstand, to the effect that the patent is dead.

J. D. M.—To convert a wooden tray into an effective sink give it several coatings of common shellac varnish, which you can purchase much more economically than you can make it yourself. Let the first coating be given with the varnish after it has been very much thinned by the addition of alcohol; for the remaining coatings the varnish may be applied in the state in which it is purchased.

Old Photo.—1. Thanks. We had already been quite familiar with the fact of the excellent keeping qualities of Dr. Hill Norris's dry plates, and a few years ago we expressly directed attention to some instances of their possession of these properties.—2. Let the gelatine be warmed to such a degree as to cause it to be thoroughly liquefied.—3. The ordinary gum arabic of commerce was meant.

Alpha.—Diaphragms having square or oblong apertures in them are quite a mistake—have never been, and never would be, used by anyone possessing a knowledge of the true functions of a diaphragm. We decline to say what we think of the recommendation of the photographer to whom you allude, but you never heard of any optician of eminence adopting such fantastic shapes for *his* diaphragms as those you have drawn.

Bessie.—Of the *cartes* enclosed No. 2 is the best. The most perfect landscape is the one in which there are the ruins of a cottage on the right. A piece of red blotting-paper, made wet and pressed against the back of the plate, would have prevented the blurring round the drawing-room window. It is absolutely necessary that the blotting-paper be made wet, otherwise it cannot be placed in optical contact with the glass plate, which is absolutely essential to success.

W. H. T. inquires the simplest method of photographing silver plate. We reply: the general principle on which to proceed is to reduce suddenly the temperature of the silver plate until a slight deposition of moisture from the atmosphere takes place, by which means the black polished lustre is converted into a fine matt surface. If the article be a jug this condition is easily brought about by placing in it any of the numerous freezing mixtures obtainable, or even a lump of ice.

Alba Ferrotype Plates.—We have received through Mr. John J. Atkinson, of Liverpool, a beautiful specimen of albatype sent to the Publisher by Messrs. E. and H. T. Anthony and Co. This style of picture will, we think, "take" well; at any rate, Mr. Atkinson is in a position to supply photographers with these plates, so that the commercial experiment is not difficult to be made. They have much to recommend them over opal glass, the brittleness of which is a serious drawback.

J. W. B. says:—"In one of the public cemeteries in this neighbourhood there is an attractive monument recently put up, which I was on the point of photographing when I was stopped by the gardener, on the ground that the owner and the architect had an objection to its being photographed. Will you kindly say, in your 'Answers to Correspondents,' if they have the right to do this? I promised for the time to desist (the more readily as the light did not then suit me), but told them I would take it at the first opportunity. The absurdity of the thing is apparent when I say that it is one of a group, and if their right to prohibit is good it would prevent any or all being taken. The public have free access and liberty to walk on the grass. If I succeed in getting it—as I think I shall—can I be prohibited from publishing?"——We give publicity to the peculiar case of our correspondent in the hope that some reader familiar with the legal aspect of the question will furnish a reply.

Brightonian.—If your invention was made and published at a date prior to that of the patent then you may proceed to manufacture the article as before. If we were made aware of the precise invention or manufacture to which you allude we might be able to throw more light upon the question.

A. F.—By far the best antidote to cyanide of potassium as a poison is the following, which we recommend you and every one of our readers to keep always ready in some convenient corner of a cupboard, so that if the occasion should ever arise when such an antidote would unfortunately be needed, no time might be lost at a moment when of all others "delay is dangerous:"—Provide a couple of two-ounce bottles and label them respectively A and B. In A place twenty grains of carbonate of potash and fill up with water; and in B place a drachm of tincture of muriate of iron (the "steel drops" of the druggist), also filling up with water. To this latter must be added about ten grains of protosulphate of iron just before administering it. Let the person who has swallowed the cyanide take the contents of A by itself, and immediately afterwards (having previously added the ten grains of protosulphate spoken of) let him take the contents of B. This treatment will save the patient's life.

Bookseller.—What is termed "zinc enamel" is made as follows:—Soak four ounces of Russian glue for several hours in three quarts of water and then apply heat, by which it will become dissolved immediately. Now mix with this glue one and a-half pound of oxide of zinc (or zinc white), grinding them together on a slab to ensure smoothness and freedom from lumps, and pass the whole through a hair-sieve. This enamel is applied to the paper by a broad brush, the streaks being obliterated by a flat camel's-hair brush. A second coating is usually given. When in Belfast, on the occasion of the last meeting of the British Association, we saw this and several operations of a similar nature performed on a large scale in the manufacturing establishment of Messrs. Marcus Ward and Co.; but no verbal description we could give would at all convey the information that might be acquired in half-a-minute by seeing it done. There may be treatises on the subject of surfacing paper, but, if so, we are unaware of their existence.

Mr. M. Carey Lea and Canon Beechey.—Under this heading we have received a letter from the latter gentleman, which he asks us as a matter of justice to himself to insert. Now as we have closed the correspondence, and have refused insertion to a large number of letters received on the subject, Canon Beechey will, we feel assured, pardon us for only giving so much of his letter, by way of extract, as is required in connection with the late controversy. "Allow me," he says, "to protest against the unfair and unworthy assumption of Mr. M. Carey Lea as to my chemical knowledge. I am not so great a chemist as Mr. Lea, but long before I ever put my hand to photography, and certainly long before I ever ventured to write in your Journal, I was not so ignorant of the action of light or of the various developing agencies as to suppose it one of oxidation. It is unworthy of Mr. Lea to put his finger on an old typographical or clerical error (if such there be) which every other communication must have again and again corrected, and to assert this as a proof of chemical ignorance. My usual word has been '*de*oxidation,' which, if not strictly the scientific word, is one which expresses the contrary to oxidation to all ordinary minds. I can only suppose the 'de' to have been omitted in the draft or in the type." * * * "As to pellicles," continues Canon Beechey, "I can quite understand the great advantage of a process like Mr. Kennett's, where the pellicle is dissolved in water, which one can get anywhere; but if I have to carry ether and alcohol with me to dissolve a pellicle, I should greatly prefer to carry the alcohol bromised, and to mix and make my emulsion as I wanted it."

In Type.—We are compelled to leave over this week articles by Mr. M. Carey Lea, Mr. G. W. Webster, Mr. D. Winstanley, Mr. W. J. Stillman, and others; also a portion of *Foreign Notes and News.*

**☞ Editorial Communications should be addressed to "THE EDITORS"—Advertisements and Business Letters to "THE PUBLISHER"—at the Offices, 2, York street, Covent Garden, London, W.C.**

## METEOROLOGICAL REPORT,

*For two Weeks ending May 5, 1875.*

Observations taken at 406, Strand, by J. H. Steward, Optician.

These Observations are Taken at 8.30 A.M.

| April. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 22 | 29·89 | E | 39 | 42 | 44 | 40 | Raining |
| 23 | 29·97 | NE | 37 | 41 | 52 | 37 | Fine |
| 24 | 30·22 | E | 37 | 41 | 53 | 36 | Dull |
| 26 | 30·21 | W | 41 | 47 | 51 | 38 | Dull |
| 27 | 30·04 | S | 47 | 53 | 70 | 45 | Fine |
| 28 | 30·14 | W | 49 | 52 | — | 49 | Fine |
| 29 | 30·16 | W | 48 | 53 | 66 | 47 | Fine |
| 30 | 30·09 | W | 48 | 52 | 73 | 47 | Fine |
| May. | | | | | | | |
| 1 | 29·93 | SE | 49 | 50 | 54 | 49 | Raining |
| 3 | 29·95 | W | 49 | 53 | 70 | 47 | Fine |
| 4 | 29·98 | SE | 51 | 55 | 69 | 50 | Dull |
| 5 | 30·01 | S | 53 | 59 | — | 50 | Dull |

CONTENTS.

# THE BRITISH
# JOURNAL OF PHOTOGRAPHY.

No. 784. Vol. XXII.—MAY 14, 1875.

## COMMITTEES FOR INVESTIGATING PROCESSES.

The task to be undertaken by gentlemen composing a committee for investigating and reporting upon the matters mentioned by Colonel Stuart Wortley in his paper on Tuesday evening, when he suggested its appointment, would, indeed, be a thankless one. The members of such a jury would have to be passionless and pachydermatous in no small degree. To pronounce a decision in favour of the alpha process in preference to the omega process would gratify the partisans and adherents of the former, and afford them unmixed satisfaction; while to the friends of the latter process the adverse judgment would seem to be but the foregone conclusion of a clique or faction hostile to their interests. In matters photographic opinions are often held so tenaciously that we think it, on the whole, a matter of congratulation that the London Photographic Society has not proposed such a committee as the one suggested. Indeed the Chairman, Mr. Glaisher, showed his knowledge of "photographic" human nature by offering a decided opinion that no committee appointed by the Society would carry in connection with its decisions the weight that was desirable or expected.

There are many simple matters of fact that might be easily treated by, and a decision on which would be immediately accepted at the hands of, a committee. Among these there is one matter which would form a proper subject for such treatment, and to which much prominence was given by Colonel Wortley; we refer to the fact, or alleged fact, that the addition of nitrate of uranium to a negative silver bath renders it more sensitive. But why ask a committee to examine into and report upon a matter of this nature? Photographers will accept Colonel Wortley's own assertion that such is a fact, nor will they require the further testimony of Captain Abney which the Colonel gave in corroboration of his statement. That such increase of sensitiveness results either is or is not a fact. So, at all events, will reason the photographic public. Some will accept the assurance given at the meeting as being all-sufficient for them, and inscribe it among their articles of faith accordingly; others may be sceptical, and prefer to verify it by the *experimentum crucis* of dropping a few crystals of nitrate of uranium into the bath, and by this simple tentative method obtaining such *data* as will enable them to arrive at a conclusion satisfactory to themselves.

Again, to take another example: if we correctly comprehended the meaning sought to be conveyed by a sentence in the paper (which we have not yet had an opportunity of seeing, but shall publish in our next), it appears to be the opinion of the author that dry collodion plates may be rendered quite as sensitive as dry gelatine plates. Now many photographers believe, rightly or wrongly, that at present the balance of sensitiveness inclines in the direction of gelatine. Now, how would a committee propose to deal with this subject, and give a decision acceptable to all? We have had communications from adherents of the gelatine side, in which they eagerly challenge collodionists to meet them in conflict in the field, and decide the question in the only way in which it can be decided, namely, in a contest with cameras and the best commercial plates of both kinds that can be obtained. Now if in a competition of this kind a judgment should be formed in favour of one of them—the gelatine, for instance—it is scarcely to be expected that those who have already pronounced their opinions in favour of an opposite view would readily "eat the leek," by revoking a previously-expressed opinion and swallowing their own words. Rather would they be apt to hold that the verdict of the jury was incorrect, and given on insufficient information.

We regard the appointment of juries, or committees, for testing processes in very much the same light as we do those for awarding medals or degrees of merit for pictures exhibited at an exhibition, and we have already had occasion to express our opinion on this point in terms too unmistakable to admit of any doubt,

## IMPROVEMENTS IN PRINT BURNISHERS.

Since we gave a description in vol. xxi., pp. 241, 540, of the Weston American hot burnisher—which since that period has been introduced into this country and is now well known to many of our readers—several improvements have been introduced in the construction of the instrument. Mr. J. P. Bass, of Bangor, Maine, who is the proprietor of the first patent, has obtained another patent for an improvement which we shall describe.

In the instrument which was the subject of the previous articles the motion of the picture over the burnisher was a direct or rectangular one; but certain advantages—whether real or merely alleged we cannot from experience say—are stated to be derived from causing the picture to pass across the face of the roller in an oblique direction, for that, after all, is what the various oscillatory, vibratory, pulsatory, or undulatory motions which either the picture or the burnisher assumes in regard to each other really amounts to. A considerable number of ingenious persons have taxed their inventive powers in the endeavour to secure this reciprocating motion, and several patents have been obtained in connection with this movement; we shall, however, confine our remarks, meanwhile, to one only of these, that being the invention for which Mr. Bass has obtained a patent.

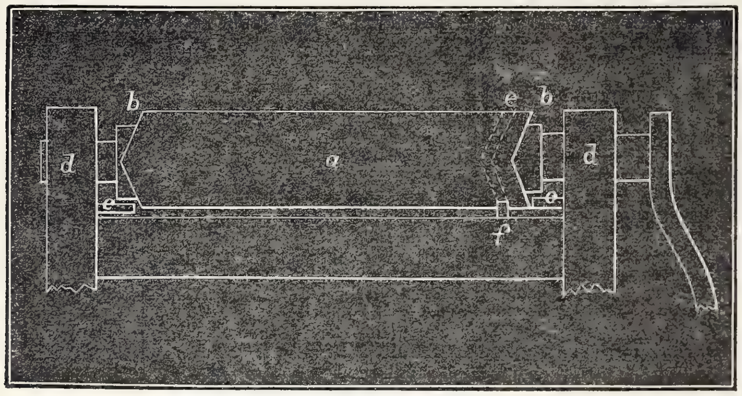
In one invention the bar which acts as a burnisher is made to traverse too and fro in guides; in another the whole burnisher, moving on an axis, oscillates through the agency of a pin acting in an oblique groove cut into the feeding roller; in the invention which forms the subject of the present article the burnisher is stationary, but the roller by which the picture is supplied, or passed on, to the burnisher is made to receive a vibratory motion, and as that roller is roughened it drags the picture with it in a zig-zag manner over the burnisher.

In the provisional specification of the last-named invention three improvements on previously-existing burnishers are mentioned. The first part consists in making the burnishing edge or tool by which the polish is given removable from the plate supporting it, so that it may readily be removed if scratched or otherwise injured. This is effected by grooving the plate under the feed roll and inserting a bar of polished metal, which may be removed at pleasure. The second improvement consists in substituting for the metallic bar a strip of glass or similar material having a highly-polished

surface, this strip being, like the steel bar in the previous improvement, made to fit the groove in the plate. These two improvements, however, are disregarded in the completed specification, in which attention is concentrated, so to speak, upon one point alone, and which we give in the language of the patentee, who says—

"My present invention consists in giving to the feeding roll a slight endwise vibration over the burnishing tool. The surface of this feeding roll being slightly rough this motion is communicated to the card or picture, giving to it a rubbing or to-and-fro motion over the burnishing tool in addition to its movement across it."

The method by which this motion is given is shown by the following diagram, in which the roller *a* is shown as having cams or cam




surfaces, *b b*, cut at each end, against which bear pins *c c* attached to the standards *d d* of the machine, so that as the said roll revolves the pins force it into a vibratory motion in addition to its rotary motion. The same result may also be accomplished by a grooved cam, cut either in the periphery of the roll, as shown in dotted lines *e* (or of its arbor), a pin *f* attached to the stationary part of the machine working in the said groove.

In the preamble to the patent Mr. Bass states that he is quite aware that certain modifications have been made in the construction of the Weston burnishing machine, of which, as we have said, he holds the patent both in this country and America, among these modifications being the making of the burnishing tool removable from the supporting plate, and supplying independent feeding mechanism for passing the card through the machine. Other changes also—such as giving to the burnishing tool a slight oscillating movement under the feed roll—have been described. "Therefore," says the patentee, "I do not claim any of these devices to which reference is made in the specification of the said former patent, nor do I claim polishing machines in which the picture or other article is passed between two rolls geared or otherwise connected, as I am aware that this device is old, the rolls being in some instances so arranged that one revolves with greater velocity than the other, or, what is the same thing, their velocities are equal while the rolls are of different diameters, the effect being to give a rotary friction upon the surface of the card. I regard these devices simply as modifications of the old two-roll press, whereas in my machine the tool communicating the polish to the card or picture is non-rotating."

From the foregoing we are not quite clear whether the patentee, by abstaining from making any claim for the imparting of an oscillating motion to the *burnisher*, does not allow the inference to be drawn that he considers he cannot lay claim to it. We feel a certain amount of interest respecting this point, because we know that Mr. Bass at present looks upon "Entrekin's oscillating enameller" with disfavour, and on the 30th of January last obtained from the Examiner of Patents a decision in his favour as against the claim of William G. Entrekin, the official document announcing this decision being now before us. From this we learn that a statement which has been made in this country to the effect that the stationary burnisher was known and used in America for burnishing photographs more than two years prior to the Weston patent being issued is not borne out by the facts of the case.

There is a great deal of "thunder in the air" as regards rival burnishers; and from a letter we have received from Mr. Bass we learn that he is about to visit this country during the forthcoming summer, when, he states, he will institute proceedings against infringers of his patent. We trust that he will do so, for by one action—a friendly one, if requisite—the present state of uncertainty prevailing with regard to these rival burnishers will be effectually terminated.

## ON THE PHOTOGRAPHING OF TREES.

We presume that, whatever may be our position as regards portraiture in comparison with our continental neighbours, it will readily be admitted that we occupy the front rank in the production of landscape work. No one, however, who will carefully examine the portfolios of his friends, especially if the collections be of a miscellaneous character, will be prepared to deny that, as a rule, the trees are the weak points of our pictures. We do not by any means assert that the foliage in all the pictures will be faulty, but that in probably nine cases out of ten it will be found wanting in the charm of form to which it owes so much of its individuality; hazy in the outlines, especially towards the top; and, where the exposure has been such as to do justice to the other portions of the landscape, wanting in crispness and detail over the whole mass. To overcome these defects is a matter of no small difficulty; and, as we have recently had opportunities of discussing the question with several of our most successful photographers, we propose to give our readers the benefit of their opinions, based on considerable experience.

We may here premise that on looking over the collected works of most of our professional photographers we have often been struck with the absence of, to any considerable extent at least, examples of studies of single trees, which, we believe, would not fail to meet with ready acceptance and sale, and which, we feel certain, must, from an educational point of view, be of considerable value to the public generally. Anyone who will take the trouble of instituting the necessary inquiries among his acquaintances will be surprised to find how many there are who really cannot, except in a very few cases indeed, appreciate the difference between any half-dozen different varieties of trees to be met with in a forenoon's walk. We remember an amusing example of this too common want of a particular branch of knowledge. A number of years since there were sent from Scotland to one of the exhibitions of the London Photographic Society a large number of charming studies of trees and plants, especially of the more popular and better-known kinds. In due course the pictorial work in the exhibition was reviewed in one of the photographic journals, the critic directing special attention to the collection in question, and, while highly complimenting the artist on his taste and photographic skill, added that he had shown himself to be a botanist of considerable ability. Now the curious feature in the matter was this—that when the pictures were returned to the owner it was found that in nearly every case they were *wrongly named*, and this notwithstanding the circumstance that the reviewer was a man who held a high position in scientific, literary, and art circles.

One cause of the too frequent failure to photograph trees in their natural form as presented to the eye is the fact that the camera is generally placed much too low to include the foliage in the view, and, as a consequence, the instrument has necessarily to be somewhat "cocked" up. The result is that it is impossible to obtain the fine masses of light and shade caused by the denser portions of the foliage-clad branches, while the form of the various outlines is altogether different when thus looked at, as it were, from below. The remedy is obvious, though not always easily applied. The camera should be very much elevated—say to half the height of the tree, where possible. Of course the removal of the camera to a sufficient distance would secure a somewhat similar result, but then the size of the tree would be so diminished as to entail the labour of enlarging the negative.

Another fruitful source of trouble in dealing with trees is the difficulty experienced in the absence of the necessary stillness of the atmosphere. Now and then we are fortunate, during our various excursions, in enjoying a day in which motion is so slight as to be imperceptible; but only those who have tried this kind of work really know how much harm may be done by even an inconsiderable

amount of unrest in foliage caused by the action of the atmosphere. One of our most clever landscapists makes it a rule, in all cases where practicable, to leave out the tops of the higher branches, as, being not only higher but also much lighter, they are more easily affected, and, in point of fact, are scarcely ever in repose. He holds the opinion that, while he thereby gets rid of much objectionable motion, his picture is perhaps all the better for leaving something suggested to be supplied by the imagination. From another we learn, as the result of many years' observation, that those who are anxious to secure the highest possible excellence in this class of work should have all their arrangements made by the beginning of next month, as he asserts that whenever there has been a trace of frost on a June morning perfect atmospheric stillness may be absolutely depended upon for several hours during the morning. We have every confidence in our friend's powers of observation, and therefore recommend our readers to make a note of the statement.

As a matter of fact there are great differences between the various kinds of trees as regards their liability to motion. Some of them, such as the Scotch fir, can bear a considerable amount of tolerably rapid oscillation in the atmosphere without seeming to be affected thereby; while others, such as the willow, would almost seem to have a tremulous motion indigenous to their class, independent altogether of the movement of the air. In fact, neither the willow or the birch can be successfully photographed, even on the calmest day, unless the operation take place sufficiently early in the morning to be accomplished before the temperature of the air begins to rise. This proceeds from the fact that the leaves of both hang so tenuously as to be moved by the slightest atmospheric agitation, and, as soon as the first ray of sunshine is projected from the eastern horizon, the ascending and descending currents thus set up render the production of a good picture of either of the class of trees referred to above a hopeless task. The observation applies, although in a somewhat less degree, to many of the other woody denizens of our landscapes, and so we may say that "early to bed, and early to rise," should be the motto of every landscape photographer, who might thus—

> "Improve the pleasure of the day,
> While tasteless mortals sleep their time away."

Hitherto we have spoken principally of photographing trees as studies; but it is a matter of quite as much difficulty to get any landscape of really fine quality in which trees form conspicuous objects, because—although from being simply accessories in the finished picture they need not be so perfectly "caught" as where they form the principal objects—the difference between the actinic power of the light reflected from green foliage and that from most of the other objects in the landscape is so great that it is very often impossible to do full justice to both. The great mass of the light which passes from the leaves to the lens is, in consequence of the absorption of the red and violet rays, just the kind which has little or no action on our sensitive films as generally prepared, and, if there were nothing else, trees generally could only be represented by black masses. In addition, however, to the green ray which is projected from the leaf itself, there is always a certain—or, rather, uncertain—amount of white light reflected from the surface, and it is to this, and this alone, we owe such representations of foliage as we obtain. As a consequence we find that leaves, quite independently of their colour, are more or less easily photographed in proportion to the more or less glossiness of the surface—a result which explains the well-known fact that trees generally require a much shorter exposure immediately after a shower of rain; and this should serve as a hint to those who, not infrequently, are required to take a negative of a light-coloured building with masses of dark foliage against its walls to make free use of the hose or of the watering-can. This we know from experience to be of great value, the moist surfaces of certain leaves reflecting a very much larger quantity of white light than when in a dry condition.

Still the moistening of foliage is of but very limited application, and before mixed landscape work can come to perfection we must hit on some means of getting a film that shall be more or less affected by the green ray. This we hope is a desideratum soon to be accomplished, as, if there be any truth in the alleged discovery of Dr. Vogel, that the addition of certain colouring matter to the film renders it sensitive to the absorbed rays, there should be no difficulty in making our films for landscape work to sufficiently absorb the green, thereby getting something approaching uniformity in the exposure of every portion of the landscape.

We strongly recommend those of our readers who have the necessary leisure for such experimental work to take advantage of the present suitable season, as we have not a doubt that some valuable and much-needed progress may be made in this direction. We have on hand a series of experiments which, so far as they have gone, are at least promising. When they are finished we shall report the results, and hope soon to hear that there are many labourers working in the same field of useful experiment.

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We have received another important communication from Mr. H. Cooper on the subject of Mr. M. Carey Lea's chloriodo-bromide process. Further insight into the process has shown that it is less difficult to emulsify the iodide of silver than even Mr. Lea himself has found. We can thoroughly endorse all that Mr. Cooper says regarding the *appearance* of an emulsion as a criterion of its working properties, as we consider this the best, if not the only, test which can be applied without resorting to the preparation and development of a plate. The question of the true quantity of silver required to neutralise the haloids in the collodion is one which, in view of the uncertainties surrounding the real composition of some of the substances employed, is difficult or impossible to decide upon without actual trial such as Mr. Cooper has made. The *aqua regia* is such a variable and uncertain composition as to render it almost impossible to give it a truly reliable equivalent. Mr. Cooper is perfectly correct in what he says regarding the inconvenience attending the *measurement* of this acid in small quantities of a few minims, but shows that the error which arises if *drops* be used instead of minims is so small as to be virtually of no consequence, and in the case of an excess of four or five grains of silver quite inappreciable. The sample of cupric chloride used by us in our experiments appeared to be of a very deliquescent nature, and required to be dried by heat before weighing out. After solution in absolute alcohol there remained a small quantity of powder, which, when washed in fresh alcohol, proved to be nearly colourless. Except upon *theoretical grounds*, we think that the slight uncertainties thus introduced will matter but little in the final result when such a quantity of silver is used as to leave a calculated excess of five grains to the ounce, though, of course, it is as well to be exact. The experiments recorded by Mr. Cooper in his article—experiments which we may be sure have been carefully carried through—go far to corroborate what has been previously written on this subject by Mr. M. Carey Lea.

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## THE CHLORIODO-BROMIDE PROCESS.

It has often been stated by emulsion workers that *age* in bromised collodion is a great advantage; the sensitive salts being more easily emulsified with an old collodion, and the resulting film being more even and free from all defects, than when a newer sample was used. In Mr. M. Carey Lea's new process it has been mentioned that ripeness of the collodion was most important; but until lately I, for one, had no idea of the vast difference made by the age of the collodion.

I have one lot now in use in which the iodide of silver does not show the slightest tendency to precipitate at any stage of the preparation of the emulsion. As a rule, it will generally be found that at a certain point in the admixture of the silver and bromo-iodised collodion the sensitive salts form into clots, which are only dissipated by more or less violent shaking. It may be remembered, in announcing the details of his new process, Mr. Lea said that iodide of silver only required a good shaking to coax it to emulsify; but I can now state as a fact that, with a collodion in a suitable condition, iodide of silver will emulsify with as much ease as bromide or chloride.

The history of my useful bottle of collodion is rather interesting, as showing that one day there will be a use for everything. In looking over my collodion cupboard I found several bottles with the

remains of bromised collodions prepared by various formulæ, which were duly recorded on each bottle. Some of these bottles had been kept for three or four years. Thinking that perhaps I might now utilise them I measured the contents of each bottle, mixed them all together, and then doing a little arithmetic I ascertained the quantities of iodide and bromide required to bring the proportions up to the formula quoted last week. After standing for a week to settle I took four ounces of it, added eight drops of *aqua regia*, and proceeded to emulsify with 100 grains of nitrate of silver dissolved in two ounces of alcohol.

As I gradually added the silver I was delighted to see the emulsion assume a clear orange tint when allowed to run down the side of the bottle, which proved that the particles of sensitive salts were remarkably fine. Directly an emulsion becomes greyish or opaque when the bottle is held between the eye and the source of light, so that a film of the emulsion is seen on the side of the bottle when viewed by transmitted light, it shows clearly that the emulsion is getting into a state unsuitable for good work. I "got in" the whole of my 100 grains of nitrate of silver without the emulsion showing the least tendency to precipitate, and when it was finished it presented the same good appearance as during its preparation.

I tried another lot, adding the silver very hastily (a course which is usually fatal), and with the same good result. I ought, perhaps, to mention that each of the collodions used for this splendid mixture were thoroughly well adapted for ordinary emulsion work. This bit of experience is most interesting to me, as it shows we have only to hit the right condition in our collodion to have no further trouble in emulsifying iodide of silver—a thing which three months ago I believed to be impossible.

Little did I dream when I stacked away these odds and ends of bromised collodions that I should ever bring them into use by adding an *iodide* to them for quick emulsion work. "Time changes all things," and nothing so much as our beliefs of the possible or the impossible.

*Washing the Emulsion.*—In the thorough washing necessary in the preparation of pellicle a difficulty arises with these very sensitive collodions, owing to the necessity of shielding the emulsion as much as possible from light during the whole course of its preparation. I have lately devised a plan for washing which answers admirably. I procured several very dark orange-coloured hock bottles, and by means of a file and mallet knocked out the bottoms of some of them, and with several others of the same kind I operated by cutting off their necks. These latter form capital jars in which to soak the pellicle in the preservative after it is removed from the dish in which it is evaporated. To wash the pellicle a small piece of muslin is fixed over the mouth of one of the bottles with no bottom, either by tying with string or by means of a small elastic band, and the pellicle and preservative is poured from the jar (*i.e.*, the yellow bottle with no neck) into this bottle, which is practically converted into a funnel. Over the bottom of the bottle I now fasten a piece of muslin with a strong elastic band, and, having turned the bottle right way up, I remove the bit of muslin from the small mouth and allow a stream of water to flow through the bottle.

After washing for some time in this manner the bottle is placed in a deep vessel of water to soak for an hour, when the rinsing under the tap is repeated. As the pieces of pellicle are apt to get firmly stuck together, I find it a good plan to thoroughly stir them up after each hour's soaking in the following way:—One hand is placed over the bottom of the bottle until it is filled with water from the tap, and a cork now being inserted in the mouth the contents may be as violently shaken as is deemed necessary. On the removal of the cork the water, of course, drains away through the muslin at the bottom of the bottle. It will be readily perceived that by adopting this means of washing the pellicle it is doubly protected from the action of actinic light. Of course the whole proceeding is carried on in the yellow-lighted room, commonly miscalled the "dark room;" but these new emulsions are so sensitive I am afraid to expose them to even a good orange light more than I can help. Some of my readers may ask—But why not wash the pellicle under the tap in the bottle, as it is at first arranged, with the muslin over the mouth? Why take the trouble to fasten muslin over the large end of the bottle, and then invert it? I answer: because in practice I find the smaller particles of pellicle get down all together in the narrow neck, and prevent the water flowing through rapidly enough.

*Choice of Terms.*—In describing any new process it is almost necessary to use technical terms, many of them in a new way; and, as it is convenient we should all mean the same thing when we use a certain term, I believe it will be well occasionally to arrange that a word shall be restricted in its meaning. In the washed emulsion processes I propose we shall always call the emulsion "the pellicle" as soon as it has *set* in the dish into which it is poured for evaporation. We shall then always be readily understood when we write or talk about pouring a preservative upon the "pellicle," cutting up the "pellicle" and separating it from its dish, washing the "pellicle," drying the "pellicle," &c., &c. At present, many people only call the sensitive preparation the "pellicle" when it is dried and ready for re-solution to form the washed emulsion.

*Mr. Stillman's Article, May 7th.*—On the vexed question of the amount of nitrate of silver required to exactly decompose the iodide, bromide, and chloride in Mr. Lea's formula, I may mention that in using the formula quoted last week I find, *practically*, there is an excess of nitrate of silver in the emulsion when using only twenty-five grains to each ounce of collodion. Supposing the ordinary crystallised bromide of cadmium to contain four equivalents of water, which will raise its atomic weight to 172 (old notation), the nine grains used in the formula will decompose nine grains of nitrate of silver. Then, again: the quantity of silver required to decompose the proportion of *aqua regia* ordered to be used by Mr. Lea is not so large as stated by Mr. Stillman in his analysis of the formula. Mr. Lea specially orders *drops* to be used, and with *aqua regia* these will, in most cases, not be *minims*. Although, "while a chemist who talks of drops as a measure talks of an uncertainty, and is properly taken always to mean minims," there may arise circumstances where in practical work it is advisable to use *drops* of an ingredient in preference to measuring minims. Now with *aqua regia* just such a necessity for an exception occurs. In making up small quantities of emulsion for experiment it would be most inconvenient to have to *measure*, say, three minims of *aqua regia* for two ounces of emulsion, and so in practice it is advisable to use drops. The only correct way of measuring such very small quantities of fluids is by means of a graduated pipette, and *aqua regia* is nasty stuff to handle even with one of these most useful articles for the laboratory.

I would here specially caution all those who may be experimenting with processes in which *aqua regia* is used to be most careful not to inhale the vapour of it. It is not only very unpleasant, but it is exceedingly injurious and irritating to the lungs and delicate mucous membrane lining all the air-vessels.

I cannot resist saying that I think Mr. Stillman's implied sneer at Mr. Lea for using and recommending "drops" was uncalled for. I have just taken the trouble to measure the drops of *aqua regia* from the bottle in which I always keep it, and I find twenty-seven drops measure exactly twenty minims; so that in each ounce of collodion I have one and a-half minim only.

But when we come to the chloride of copper a much more serious doubt arises. I obtained my chloride of copper from Messrs. Hopkin and Williams, and may therefore conclude it is of fair commercial quality; and on testing it I find that two grains will only decompose two and a-half grains of nitrate of silver! Mr. Stillman gives five grains as the quantity required; so here is a wide difference between theory and practice! But then the theory is here again wrong. No allowance is made for the water of crystallisation. In Fowne's *Manual of Chemistry*, page 396 (edition 1873), the constitution of crystallised cupric chloride is given as $Cu\,Cl_2,\ 2H_2O$. Taking the new atomic weights of copper and oxygen this formula will give us the combining equivalent as 85·2 (the half of 170·4, the atomic weight of the crystals with two equivalents of chloride). According to this the cupric chloride I am using must either have contained much more water or some impurity. As soon as received from Hopkin and Williams I dissolved it in alcohol, at the rate of sixty-four grains to the ounce.

To set one part of the question at rest I have performed the following most interesting experiment:—In two ounces of pure distilled water I dissolved nine grains of bromide of cadmium crystallised, two and a-half grains of bromide of ammonium, and two grains of iodide of ammonium, and then added two *drops* of *aqua regia.* Into this was now poured twenty-five grains of nitrate of silver dissolved in two ounces of water, and then fifteen minims of a sixty-four-grain alcoholic solution of cupric chloride were added, and after well stirring the mixture was placed in a filter. The precipitate was washed with an ounce or two of distilled water to make sure of having all the soluble salts, and the clear filtrate was now tested for nitrate of silver. A volumetric solution of pure chloride of sodium, thirty-three grains to the ounce, was used. (Each five minims of this will decompose one grain of nitrate of silver.) To the filtrate fifteen minims of the chloride solution were added, which produced a copious precipitate of chloride of silver. This turbid solution was again filtered, and found to still contain free nitrate of silver. Five minims more of the volumetric solution were then added, and, after filtering, the solution was found to be free from nitrate of silver. The result of this experiment shows that there

remained between three and four grains of nitrate of silver out of the twenty-five grains used over and above what was required to decompose the iodide, bromide, and chloride.

I pen the following analysis of the formula, not *dogmatically*, but as bearing more likeness to the real facts than Mr. Stillman's :—

| | | | | |
|---|---|---|---|---|
| 9 grains | Cd. Br. cryst. | (at. wt. 172 ?) | ...... | 9 grains nit. silver. |
| 2½ ,, | Am. Br. | ( ,, 98) | ...... | 4·336 ,, ,, |
| *2 ,, | Am. Iod. | ( ,, 145) | ...... | 2·344 ,, ,, |
| 1 minim | H. Cl. | ( ,, ?) | about | 2· ,, ,, |
| 2 grains | Cup. Cl. | ( ,, 85·2 ?) | ... | 4· ,, ,, |
| | | | | 21·680 ,, ,, |

Oddly enough, this arithmetical "conversion" of the formula gives the same figure for the amount of nitrate of silver required to decompose the salts as I found by actual experiment to be the case. But how about the cupric chloride?

There is evidently something wrong somewhere. However, both theory and practice show we have a considerable excess of nitrate of silver when using twenty-five grains to the ounce, as stated by Mr. Lea. HENRY COOPER.

## DURABLE SENSITISED PAPER.

A METHOD of preparing sensitised albumen paper that shall not become deteriorated by a moderate amount of keeping has been at times much sought after, and naturally so, as the result is obviously desirable; but at present, although it is demonstrated by the article being manufactured and sold by several houses that the thing can be done, no method has yet been published that can compare with those in the possession of the manufacturers.

Of the published methods is one of Mr. Hopkins for keeping the sensitised paper between sheets of blotting-paper which have been saturated with carbonate of soda. This plan is said to answer; but it is, at all events, not that employed by the trade makers, whose paper does not require this mode of keeping.

Another method proposed is that of washing out the free nitrate of silver from the paper previous to drying. Paper thus prepared, however, requires to be fumed with ammonia before it can be used, and it then deteriorates even more rapidly than paper prepared in the ordinary manner.

A third plan has been tried—that of adding citric or tartaric acid to the nitrate bath, by which the paper retains its whiteness for some little time; but, unfortunately, the prints on paper so treated tone with difficulty and without richness. I believe this may be greatly remedied by fuming, as in the case of washed paper; but the fact remains that the sensitised papers of commerce do not require any fuming, and, so far, the secret plan is, therefore, decidedly the best hitherto introduced.

It is rare that a secret process is used for any length of time without the mystery being discovered and published by other workers. It is rarer still that a process should be used (the result, presumably, of distinct discoveries) by several business houses and the method still remain entirely unknown to the readers of the technical publications.

With the view of directing the attention of those who have leisure for investigation to a method with which I have obtained some success I ask you to give publicity to the agent I found to produce the result. This agent is perchloric acid, of which I add about ten drops to each ounce of bath. It certainly has a decided effect in preserving the whiteness of the paper, and the prints tone precisely in a way similar to those prepared upon an ordinary bath.

I was led to experiment with perchloric acid from its great oxidising power; and the theory I suggest is that it at once decomposes in the paper those organic matters which act upon and produce discolouration of the nitrate of silver. The acid is probably entirely decomposed by the time the paper is dry; and the fact that there is no retarding or impoverishing effect upon the toning, as is the case with other acids which have been used, may thus be explained.

I have not tried the addition of perchloric acid as a corrective for a foggy negative bath, but I think it should succeed.

W. E. DEBENHAM.

## COLORATION OF STATUARY.

[A communication to the Edinburgh Photographic Society.]

THE purpose of this paper is to introduce a somewhat novel mode of treatment of statuary, being a much modified kind of coloration, dealing at most with two colours, and even using by preference the simple admixtures of black and white; and in order to show that this should be regarded as a very mild innovation I may quote a few facts and opinions regarding the practice of the Greeks at a time when they had attained to their highest excellence in the sculptorial art.

The two most celebrated works of Phidias—the *Minerva* of the Parthenon and the *Olympian Jupiter*—were of gigantic size, and both composed of an immense number of pieces of ivory and plates of gold, the naked parts of the figures being of ivory and the drapery and accessories of the metal; and, in the case of the *Minerva* at least, the eyes were formed of inserted precious stones. Again: the renowned work of Polycletus, the *Juno* of Argos, was similarly built up of ivory and gold; and not only were the eyes frequently inlaid with metals, glass, and precious stones, but sometimes also the lips. Colours were also frequently applied to the eyes, lips, and hair, as well as to the drapery and ornaments. It does not appear, however, that means were used to give the appearance of complexion or rose tint to the cheeks in the case of marble statues; but it is a curious fact that this effect was by some method imparted to some bronzes even of great excellence—the works of Praxiteles and other sculptors. The gilding of the hair in marble statues was a very common practice. These aids to the expression of the simple statuary appear to have been employed more or less throughout the 300 years during which Grecian art maintained a high position, *i.e.*, from the times of Pericles down to the fall of Greece to the status of a Roman province; and we may therefore well suspect that our present notions of what constitutes legitimate art in sculpture are far too restrictive.

The ancient Romans in their polylithic work departed still farther than the Greeks from the simplicity of ordinary sculpture. They attempted to copy very closely the actual tints by building up the statue with pieces of coloured marbles and alabasters; but we may pass over their doings as carrying less weight in question of taste.

Owen Jones is of opinion that the Greeks used colour very generally, both on buildings, sculpture, and groups, and that even the flesh was coloured, but only conventionally, so as to avoid any attempt at direct imitation of nature.

I do not offer any arguments or opinions myself in favour of the use of a variety of actual colours even employed conventionally. Nor do I propose to apply the modified treatment to every piece of sculpture; for, undoubtedly, there exist many beautiful statues and groups in the case of which it would be felt by all to be sinning against good taste to modify in the slightest degree their uniform white surface, or to employ any obvious device by which the eyes or other features might be more forcibly indicated than results from a pretty strict adherence to the simple portrayal of the natural surfaces. But such examples are for the most part confined to those characterised by placidity of expression, and intended to convey ideas of repose, indifference, or patience. The eye is a blank in which it is left to the imagination of the beholder to picture the appearance of intelligence, and incapable of exhibiting the side-glance of coquetry, suspicion, or alarm; or of re-enforcing the expression of the eyelids in the upward gaze of adoration, admiration, or surprise, or the downward droop of reverence and humility. And it must be borne in mind that in many phases of expression the eyelid and the eyeball contradict one another in action, as in coyness, cunning watchfulness, and horror. These the sculptor cannot render or distinguish from some of the former without marking in some way the surface of the eyeball.

Statuary is confessedly weak in the rendering of the eyes. Were the eyeball modelled exactly according to nature a very disagreeable effect would generally result from the light falling most powerfully upon the part where the pupil and iris occur, and thus rendering it lighter instead of darker than the rest of the eyeball. The most usual device to mitigate this reversal of light and shade is to make the curvature of the eyeball less instead of greater in front, securing, at the same time, a shadow from the exaggerated relative projection of the upper eyelid. But when the expression to be conveyed is active or passionate the absence of the positive shades of the pupil and iris are such unequivocal blemishes that the strictness of rendering is often still farther departed from, especially by the modern sculptor, with a view to reduce the evil. This is most commonly done by drilling a hole where the pupil occurs, so as to get a deepcast shadow as a substitute for the positive darkness, and defining the circumference of the iris by a slighter ring-like cut. Another mode of treatment is to scoop out a saucer-like depression as large in diameter as the iris. Now, no doubt, these modifications may be claimed as the work of the sculptor's tools alone; but such a pretence would be mere quibbling, for the effect is got by a direct departure from the

* I cannot see how Mr. Stillman makes two grains of iodide of ammonium, with an atomic weight of 145, convert 4·343 grains of nitrate of silver, whose atomic weight is 170.

modern sculptor's first rule of art, which restricts him to the most accurate rendering of the surfaces that the material will permit of.

But it is not in the eye alone that the want of positive shade is felt. The eyebrow even plays an important part in the expression, and here also there is a reversed effect of light and shade; but the weakness is not so seriously noticed, since the eyebrow, though coloured, is not a mere surface indication, but has its form and position defined both by elevation and variety of texture. In the case of the mouth, however, much of the individuality of expression depends upon the form and position of the line where the carmine of the lips joins the skin colour; this may be strikingly shown by changing that line in an actual face by means of painting the surfaces, or by painting variously the lips of casts from the same head. It is, therefore, a necessary and important feature in individual likeness, and it is somewhat surprising that the device of a fine cut has not been had recourse to for marking the outline of the deeper colour of the lips. I believe it is here, even more than in the eyes, that the difficulty arises in conveying the idea of likeness in portrait busts.

It might, perhaps, be possible to employ colour generally, if in a very subdued manner and under the skilful hand of a true artist, so as *not* to give rise to that feeling of repugnance produced by waxwork-like imitations of life; and some art critics indeed think that Gibson succeeded in the case of his tinted *Venus.*

The unsatisfactory feeling produced by waxwork-like imitations of life is very striking, and it may be worth attempting to get some insight into its nature. Perhaps the solution should be found in this—that the art-character of the work should never be disguised, but that, along with the pleasurable or interested feelings called forth by the beauty or effectiveness of the representation, there should be mingled a feeling of admiration for the art displayed in the portrayal. Judged by this criterion we can understand how unsatisfactory must be any attempt to produce an absolute representation of the reality of nature; for if by any possibility we were successful we could regard the work merely as a substitute for the reality, and should miss the feeling of art-admiration. On the other hand, putting aside the impossible, the nearer we attempt to approach a verisimilitude of living nature the defects in our work must become more numerous, more easily detected, and much more offensive, from the very pretentiousness of the sham.

It may be objected to this explanation that in the case of a painting on a flat surface the work is more admired the more perfect the delusion of its reality can be carried out; but here the imposition is not of the same absolute kind, and the art-admiration constitutes a large part of the pleasure experienced. Perhaps the peculiar nature of the deception attempted in the case of painted sculpture or waxwork figures may be brought more clearly out by the following consideration:—When we see a mutilated ordinary statue—say one from which has been broken part of an arm or leg—we do not find the statue to become repulsive; but if this same statue were painted, and treated in so masterly a manner as to represent a living form very perfectly, I think it must be obvious that such a mutilation as I have supposed would become hideous. Now no similar feeling could be produced by a pictured figure merely mutilated by an accident to the canvas; it only presents itself as an injured work of art, exactly analogous to the mutilated, unpainted marble statue.

But, though we may thus see that there are good grounds for eschewing any attempt to copy the actual colours at the same time with the solid forms of nature, there may be no well-founded objections to doing away with the weak points in sculpture by adopting some modification of ancient practices.

In order to the conveyance of facial expression in a forcible manner we must define the positions of the eyes, the characteristics of the lips, and the colour-markings of the hair, whether that be of the eyelashes, eyebrows, head, or beard, in a more precise and decided manner than can result from cast and contour shadows.

Taking up a photograph or engraving of a head we find the features and expression brought out by simple light and shade. But the shades are divisible into three kinds—first, the *contour shades*, or shadowings produced by the surfaces represented being placed at various inclinations to the incident light; second, the *cast shadows* arising from other parts of the subject directly intercepting the light; and third, the *colour shades* representing the darkening effects of the colours of the surfaces, or their power of absorbing in various degrees the light that actually falls upon them. And, as supplementary to this classification, we must not overlook the important modifying effects of the more or less polished states of the surfaces.

In the simplest white statuary the effect rests wholly upon the contour and cast shadows, with occasionally (as in the *Veiled Vestal*) the employment of the contrast of polished and unpolished surfaces. Now, the purpose of my paper is to suggest and enforce that we should superadd the third kind of shading representative of colour, but in as great moderation as may be, and by preference only using shades of grey when the whole surface has to be painted.

When the general surface of the statue or other piece of sculpture has not to be painted, and possesses of itself a tint different from grey, we must be guided in the choice of the two extremes of the scale of shades to be used in our dichromatic treatment, by the analogy of an engraving printed in brown or other coloured ink upon tinted paper; the scale of shaded tints to be employed should be such that the natural colour of the material will take its place as one of them; and it is open, of course, to apply any such dichromatic scale, even when all the surface of the subject is to be painted or enamelled.

Restricting ourselves to the use of such a scale of shades, I believe we could attain to much excellence of effect, without in any degree awakening the disagreeable feeling that results from attempts to give lifelike colour. A piece of statuary so treated would, in fact, convey all that an engraving could, with the added charms of stereoscopicity, changing points of view, and changing arrangements of the lighting.

And, as connecting the subject with this Society, I may state that a bust so shaded would be a most valuable addition to the studio of the photographer, to assist him in the practice of proper lighting. In a properly-lighted figure we must not only have the cast and contour shadows becomingly arranged, but so tempered in severity as to harmonise agreeably with the positive shades. When the cast shadows are too faint we have the eyes, eyebrows, &c., given as black marks upon a white ground; and when the cast shadows are made too decided, one or both of the eyes may be lost altogether in the gloom.

A weak point in ordinary statuary, arising from difficulties in the workmanship alone, is the absence of the eyelashes; we lose the effects both of the positive colour and of the cast shadows. This defect was well known to the ancients, and examples are still extant in which eyelashes of copper are inserted; and to make our busts completely satisfactory it would be necessary to follow some such practice. The defect may, however, be in a great measure supplied by a painted shading on the edges of the eyelids, the inner surfaces being at the same time shaded to represent the carmine tint there.

In thus advocating the employment of neutral tints, or simple light and shadow, to reinforce and complete the effectiveness of statuary, I do not wish it to be understood that I am altogether hostile to the greater innovations so ably advocated by Mr. Owen Jones; but I think the dichromatic treatment I have proposed might be erected into a distinct and not unimportant branch of sculptorial art. In carrying it out difficulties would no doubt arise, but we may trust to technical skill also arising to overcome these, should encouragement be given. I add only two hints here of a practical character:—1. Keep the polish or lustre of the flesh tints rather under than over that of nature; but the degrees of glossiness of all the surfaces should be studied so as to reproduce with approximate correctness the effects of regular and irregular reflection. 2. When the tint chosen for the nude part of the figure is lighter than in reality, let the scale of shades be all correspondingly weakened.

And now a word in conclusion on the general bearing of the subject. When we look at a complicated pattern of interlacing geometrical figures the eye, as every one knows, can single out some particular figure and regard it separately, and again and again new figures or parts of the combination may be so selected at will by the eye. Now there is an analogy between this and the contemplation of an unpainted bust; the eye through the fancy may regard it under all the different aspects that it would be possible to evolve by variations in the painting; and it may be brought forward as the chief objection to the painting of sculpture that this freedom of the fancy is curtailed, and the contemplation restricted to one phase of expression alone. Without denying some weight to this objection, and granting that some pieces of sculpture would be best left unpainted, it may be replied that the painting gives the artist the power of fixing the best aspect of his subject, or bringing out that expression which he seeks to convey; and in the case of a portrait bust everyone must admit that the advantages are all on the side of the use of shade painting or enamelling. Robert H. Bow, C.E.

## OLEO-BROMIDE PELLICLE.

Since writing the article on oleo-bromide emulsion pellicle, which appeared in The British Journal Photographic Almanac for this

year, I have altered my method of preparing it, principally by adopting the plan practised by Mr. Bolton and Mr. Stillman of sensitising the collodion before adding the bromide salts.

I do not, however, add all the bromides at once, preferring to do so in separate portions, thereby obtaining, I think, greater sensitiveness without loss of density and clearness. The following is now my method of working:—

Take four ounces of collodion containing seven grains of high-temperature pyroxyline and twenty to thirty grains of nitrate of uranium to each ounce of equal parts of ether and alcohol. Add one drachm of a saturated alcoholic solution of soft or white Castile soap; dissolve sixty-four grains of nitrate of silver in one drachm of distilled water by heat, and (if the collodion after the addition of the soap solution shows alkalinity or is neutral to blue litmus paper, not otherwise, add two drops of pure nitric acid) six drachms of hot alcohol. Allow this to cool, and add it to the saponified collodion in small quantities at a time, shaking between each addition, and allow the mixture to stand for eighteen or twenty-four hours, shaking occasionally. After standing the above time add half-an-ounce of a bromide solution made by dissolving forty-eight grains of double bromide of cadmium and ammonium in two drachms of distilled water by heat, and adding six drachms of alcohol. This should be added in the same way as the silver solution. Let the emulsion stand for six hours, and then add the remaining half-ounce of bromide solution in the same way as before. Let the emulsion stand another six or seven hours, shake up well, filter through sponge or linen, and pour into a levelled 6 × 8 inch glass dish to set. When thoroughly set wash and dry as directed in the Almanac. Make an emulsion with sixteen or eighteen grains of dried pellicle to each ounce, equal parts of ether s.g. 725, and alcohol s.g. 805, according to the size of plates used.

I have tried Mr. M. Carey Lea's method of soaking the pellicle film in a preservative before washing, but have not at present found any advantage derived therefrom over the addition of gallic acid to the pellicle emulsion recommended in the Almanac, and which will be found useful when the emulsion is used soon after formation; when a week or so old it does not appear to require any addition whatever.

The preservative I used was Colonel Stuart Wortley's salicine, gallic acid, and tannin solution. These plates do not require backing. I have lately taken landscapes on them with a whole-plate rapid rectilinear, No. 3 ($\frac{f}{16}$) stop, and found that from thirty to forty seconds in sunlight was quite sufficient exposure.

In place of forty-eight grains of the double bromide, twenty grains of bromide of ammonium, and either twenty-eight grains of anhydrous (atomic weight 136) or thirty-five grains of crystallised bromide of cadmium (atomic weight 172) may be used, and will answer equally well.

I must apologise for taking up so much of your valuable space; but, as a simple dry process appears now to be required, I thought that perhaps brother amateurs might like to hear of one that from practical experience can be recommended. John B. C. Fox.

## FOREIGN NOTES AND NEWS.

Monckhoven's Developer.—Oil Painting upon Opal Glass.—The Zodiacal Lights.—A New Style of Picture.—A Novel Definition of Photography.—M. Ducos du Hauron's Heliochromic Process.

The Berlin Photographic Society does not seem at all inclined to apply the line

"Where ignorance is bliss, 'tis folly to be wise"

to the results obtained by Dr. Monckhoven's developer, since the President again asked for an account of recent experiments with it; but no strikingly new fact concerning it was brought to light. Herr Prümm said he had tested it in various ways—first, as the paper he got along with the developer directed; secondly, as a dilution of the original fluid; and then as an addition to the ordinary iron developer. At first both solutions gave misty results, but in a few days that effect wore off, and for months they worked reliably. In the case of the ordinary developer no such change took place, neither did he remark any great acceleration. In order to be sure that he gave Monckhoven's developer a fair chance he adopted the plan of cutting a plate in two and bringing out the image on one half with the ordinary developer, and on the other half with Monckhoven's. It has often been conjectured that the latter preparation contained carbolic acid, but of that acid Herr Prümm found no trace.

The President said that Herr Luckhardt had written to him saying that the acceleration was only visible when the light was bad. With reference to the carbolic acid, Herr Koch explained that in his experiments it reduced no silver when it was unmixed; but he could not say what it might do when combined with iron, as he had not yet tried that mixture.

Herr Moebius sent some specimens of what appeared to be enamelled photographs, very delicately and skilfully painted in oil colours upon opal glass; but as the sender had forbidden the removal of the frame the members present were unable to subject these specimens to a very minute inspection, and had to content themselves with criticising the painting and offering conjectures as to the material of the photographic substratum.

Dr. Zenker called attention to the appearance of the zodiacal lights, which may be seen after sunset. These lights extend from the westermost point of the horizon to the constellation of Taurus, and are unusually bright this year, their illuminating power exceeding that of the milky way at least five times. The best time for observing them, he said, was between half-past six and eight o'clock, and he begged all photographers who take an interest in such phenomena to try to get some views of them. True the action of these lights is weak compared to that of the sun; but it is much more powerful than that of the tail of the last comet that was photographed.

Dr. Lohse said that for the observations in question he employed plates which, in anticipation of the long exposure, had been laid between sheets of wet blotting-paper; he also added some water to the collodion.

Herr Quidde thought the extreme cold would have frozen the wet plates.

Herr Prümm spoke highly of the cold-resisting power of glycerine previously dissolved in alcohol and poured into the collodion drop by drop, but he added that this substance is apt to render the results unequal.

Dr. Schimann confirmed this statement, and said, further, that when glycerine was used a great quantity of water was unnecessary.

Herr Jacobeit feared that the strength and texture of the film would be impaired if so much water were employed.

Herr Prümm then closed the discussion by a remark, based on one of Junghaus' experiments, to the effect that collodion must contain eighty-nine degrees of spirit; beyond that the mixture with the water must not go.

According to the *Moniteur de la Photographie*, Herr M. P. Liesegang has been exhibiting in Paris a new style of picture which is spoken of very highly, being described as possessing all the charm of a daguerreotype with greater vigour, and none of the objectionable reflection which detracts so much from the beauty of the latter style of picture. The novelty consists of a print in carbon upon a silver plate. The plate is prepared by polishing carefully with pumice or fine sand, and is then ready to receive the impressed tissue forming its final support. These pictures can be produced with great rapidity and at a reasonable price, being undoubtedly permanent.

Comte Ludovico de Courten, in the same journal, calls attention to a new definition of photography which he has found in the *Encyclopédie des Beaux-Arts Plastiques*, and which he naïvely describes as "very pretty." "*Photography*," says the author (M. A. Deminin), "*is a purely mechanical process dependent upon the atmosphere.*" M. de Courten suggests, "why not call it a windmill?"

M. Ducos du Hauron has published the first portion of a *résumé* of his process as he works it at the present time, giving the formulæ for the preparation of the three different coloured tissues employed. The first is made by dissolving ten grammes of carmine in one litre of ammonia, and exposing the solution to the atmosphere for some hours until the ammonia has nearly evaporated. Rain water is then added to bring the solution up to the original quantity. This is the stock solution, of which take sixty-five cubic cents., rain water thirty-five cubic cents., gelatine fifteen grammes, and sugar one gramme; dissolve by the aid of a water bath and filter. The second mixture is made by triturating in a mortar twenty-five grammes of chrome yellow and adding gradually one litre of rain water. To 100 cubic cents. of this mixture add one gramme of sugar and fifteen grammes of gelatine, proceeding as in the previous case. The third tissue is coloured with Prussian blue, the author recommending what he describes as the "*fixed blue ink* of commerce," in the proportion of from twelve to fifteen cubic cents. to eighty-five cubic cents. of water, together with fifteen grammes of gelatine and one gramme of sugar. The papers are sensitised in a bath of double bichromate of potash and ammonia of the strength of from twenty to fifty grammes per litre, the time of immersion varying with circumstances from two to five minutes. Care must be

taken to select papers of uniform texture, or, preferably, to adhere to one sample, in order to avoid unequal expansion of the three monochromatic images when superimposed. In another communication M. du Hauron recommends the substitution of aurine for coralline in the manufacture of coloured collodion, on account of its greater stability.

## "THE CONTINUATING ACTION OF LIGHT" AND OTHER MATTERS.

"The continuating action of light" is a phrase inapplicable to the reaction recently under discussion in these columns. All that is alleged is this—that the action *started* in the light is *continued* in the dark. The continuating agent, if any such there be, manifestly is not the light, but something which acts where light is not; hence the inapplicability of the phrase.

It is admitted that chromated gelatine films become insoluble—1. By luminous impression. 2. By elevated temperature. 3. By the simple lapse of time. And in each case with greater facility under the influence of desiccation.

A film insufficiently exposed beneath the negative for immediate development into a satisfactory print is found on keeping to be rectified in this respect. As this is what we should expect under clause 3 as above, it is manifestly unwarrantable to attribute the additional insolubility to continued local action in the dark, depending on the previous action of the light. The idea, then, of this continued action being one which is founded on no evidence serious refutation of it is a waste of time. The pursuit of science does not demand the controversion of ungrounded notions, for they are unworthy to be entertained. He who spends his time in such occupations but wastes his strength in razing structures which of themselves must fall!

Referring back to the clauses I have given, it is known that with a sufficiency of No. 1 a carbon print may be obtained. It is also known that with an insufficiency of No. 1 and an amount of No. 3 a like result may be produced. Does it not, therefore, seem probable that with an insufficiency of No. 1 and a dose of No. 2 a print may also be produced? In other words, does it not seem probable that mere heating of the film may compensate for shortness of exposure? I have not brought the matter to the test, and at present lack the opportunity to do so. Some carbon printer, perhaps, will try and give us his report.

Mr. Batho has remarked that "parallel rays are absolutely necessary in the production of reliefs."* He will allow me to correct him. The divergent rays of an electric lamp can scarcely be described as "parallel." The indispensable condition is that rays impinging on any portion of the negative must fall from one direction only. I cannot think that "in the curious decomposition hitherto attributed to continued action may lie a means of overcoming this difficulty"† of definitely directed rays for the production of reliefs. Any continued or catalytic action must surely be diffuse and not continued in right lines from the surface of the plate, so that its result will be of use for superficial printing only, and not for penetration to a depth.

I may remark, *apropos* of a point which has been discussed, that wet films are far less sensitive than dry. The difference I estimated some few years ago, but cannot now recal.

There are some other points on which I wished to touch, but from a desire to avoid a complication which would not improbably result in obscure discussions I withhold them. D. Winstanley.

# Meetings of Societies.

## LONDON PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting of this Society was held on Tuesday evening last, the 11th inst.,—Mr. J. Glaisher, President, occupying the chair.

After the minutes of the previous meeting had been confirmed, Sir George Prescott, Bart., was elected a member.

A paper *On Comparative Rapidity*, by Colonel Stuart Wortley, was read, in which the author advocated the formation of a committee by the Society for the purpose of investigating the sensitiveness of the various processes brought before them, for which purpose a standard light would be required. Among the subjects that might thus be investigated were the comparative rapidity of gelatine and collodion, and the effect, as respects an increase of sensitiveness, of an addition of fifteen grains per ounce to the negative silver bath.

The Chairman agreed that good would result from the formation of such a committee, but did not clearly see how the Council could carry out such a project.

Mr. J. Spiller observed with pleasure the suggestion of the addition of nitrate of uranium to the bath. The sensitiveness said to be obtained might probably be owing to the fluorescent property possessed by that salt.

The Secretary entertained a similar opinion. It would seem possible that by degrading rays of certain refrangibility it might act by bringing them nearer to G—the portion of the spectrum in which lies the maximum of rapidity.

Mr. Jabez Hughes said that the subject of appointing committees in the Society had been discussed over and over again. In France and Germany committees were appointed to report upon almost everything; but, while he often read about the appointment of such committees, he never heard of any report having been submitted by them. Without wishing to throw cold water on the proposal of Colonel Wortley, he could not forget that the few times the Society had appointed committees they had not been productive of the happiest results. One committee was appointed to report upon the best means of securing the stability of silver prints, and they worked very hard in their faithful endeavour to do so; but silver prints were not much more permanent at the present time than they were previous to the formation of such committee. There was also a collodion committee appointed, and they were certainly not much the wiser for the exertions of that body. In appointing such a committee as that suggested by Colonel Wortley, he did not know any one who would undergo the amount of labour necessarily involved. It would be an eminently ungracious task to condemn processes which they conceived not to be of much use, while no condemnation on their part would affect the view taken of it by the introducers of such processes. Very recently he had formed one of a committee appointed to test the merits of a certain thing, and he was quite sure that none of his colleagues would care to be placed again in a similar position. For his own part, he would like to see the question as to the utility of nitrate of uranium in the bath taken up and reported upon by a competent committee; but he did not see how it could be done, or who were the gentlemen of whom such a committee should be formed.

The Secretary having referred to the variation in the illuminating power of ordinary gas at various hours of the day and night,

Colonel Wortley said he had taken photometric measurements at various times throughout the day, but did not find the variation alluded to by the Secretary. Referring to the committees to which reference had been made by Mr. Hughes, they had very difficult questions to deal with; but he would only ask that the committee suggested by him should confine itself to such a fact as whether fifteen grains of nitrate of uranium added to a nitrate of silver bath conferred greater sensitiveness, and that could be verified in a few minutes. The report of such a committee would thus save the time of photographers. With regard to the increase of sensitiveness, he had found it somewhat remarkable, and Captain Abney had also found the same thing.

The Chairman conveyed the thanks of the meeting to Colonel Wortley for his paper, but said he could not see how any committee appointed by the Society could carry with it the weight Colonel Wortley imagined it would. He then referred to the importance of having a standard of illumination by which to test sensitiveness. The gas in the Observatory at Greenwich, he said, was always good, even when the town was in comparative darkness; this was owing to the extra pressure obtained in consequence of the elevation of the Observatory. He was doubtful if any good would result to photography by the appointment of such a committee; but if Colonel Wortley would at a future period favour them with his suggestions they would not prove a thankless body.

The subject for next meeting was announced to be a paper by Mr. George Hooper on *The Advantages of Sulphocyanide of Ammonium as a Fixing Agent.*

It was stated that arrangements had been made for holding an exhibition in October and November in the Gallery, Pall Mall East; after which the meeting was adjourned.

## EDINBURGH PHOTOGRAPHIC SOCIETY.

The seventh ordinary meeting of the session was held at 5, St. Andrew-square, on Wednesday evening, the 5th inst.,—the President, Dr. Thomson, in the chair.

The minutes of the previous meeting were read and approved, and Mr. James Smiles was admitted an ordinary member.

Mr. R. H. Bow, C.E., one of the Vice-Presidents, read an interesting paper on the *Coloration of Statuary* [see page 233], and illustrated his views by a number of busts and statues, both plain and tinted.

Mr. Alexander Mackay said that he had listened with much pleasure to the reading of Mr. Bow's paper. He thought the subject one of much importance, and was decidedly of opinion that there were many cases where sculpture would be largely benefited if colour could be properly laid on marble. Anyone who would take the trouble to look

* The British Journal of Photography, April 9, page 174.

† Ibid.

at a marble bust placed in an ordinary well-furnished room, would see that it was made to look pallid and unnatural by contrast with the coloured curtains, carpets, and furniture; and he had no doubt that by the judicious application of colour a bust in such a position would be wonderfully improved. He was much pleased with the effect produced by the tinting of some of the specimens exhibited by Mr. Bow, but thought the colour a little too violent, and believed that a much better result would be obtained by lighter shading.

Mr. Ross quite agreed with what Mr. Bow had said regarding the advantages to be derived by sculpture from proper colouring. There could be no doubt that in sculpture there had always been a want felt. He thought it was impossible that one could be reconciled to the absence of expression given by the eye. All else might be well enough, but the finest statue ever chiselled had always, at least, one fault—that of an indication of blindness.

Mr. Bashford thought the real difficulty lay in getting a suitable colour or tint for marble. Gibson's *Venus* was, he thought, a little too strongly tinted; but he certainly, if it were possible to do it properly, would prefer a tinted bust to one without colour, especially so far as the eye was concerned.

Mr. W. Neilson agreed with all that had been said regarding the ability displayed in Mr. Bow's interesting paper; but he must still adhere to what he had formerly occasion to state—that sculpture should not be coloured. He believed the fundamental principle of fine art was "likeness in unlikeness," which involved, to a certain extent, a departure from nature. In accordance with that principle the portrait painter gave the colours of nature on a flat surface; and on the same principle the sculptor should give the rotundity of nature without its colours. Mr. Bow did not violate that principle when he said that certain busts or statues would have their expression more pronounced by the addition of shade tints; but sculpture should be sufficient in itself without adventitious aid. The "tinted *Venus*" showed what colour could effect—giving a voluptuous beauty to a statue, but at the same time destroying the principal characteristic and chief charm of sculpture, viz., the sort of semi-transparent and spiritual effect that resulted when the human form was represented in the purity of white marble.

Mr. Turnbull thought the effects produced by Mr. Bow very pretty, and had no doubt that for busts intended to be kept under cover tinting would be a very decided improvement. He, however, had a doubt as to its suitableness on statues that were exposed to the weather. The question was one for the chemist to grapple with and try to discover some means of permanently staining the marble to the required tints.

Mr. Neilson said that, although he did not agree with the views expounded by Mr. Bow, he thought that much benefit would result from his and similar papers coming before the Society. Hitherto photographers had given far too much attention to chemicals and cash, and too little to matters at least equally important; and he was certain that if they would give more attention to art they would be both better men and better photographers. He moved a hearty vote of thanks to Mr. Bow for his remarkably interesting and suggestive paper.

The motion, having been seconded, was unanimously adopted.

The Chairman then read the following question that had been found in the box:—"What is the cause of, and cure for, streaks in the backgrounds of wet collodion negatives?"

The question elicited a somewhat lengthy and interesting discussion, in the course of which it appeared that the general opinion was that the streaks were caused by accumulation of ether and alcohol in the bath or by a horny and repellant sample of collodion. As a cure for the latter,

Mr. Bashford said that he could always, with the greatest ease, convert a sample of tough, horny collodion into one giving an open, powdery film, or at least change one that when poured on the glass and allowed to partially set and then when the finger was passed across it tore into a tough film on each side, into one that when treated in a similar way left straight lines only. The change was effected by simply giving the collodion a vigorous shaking, and then letting it settle.

Dr. John Nicol was glad to hear of Mr. Bashford's discovery. If it really were so, one of the difficulties of all dry processes would be got rid of, namely, the difficulty of getting a suitable powdery cotton. He had long known that believers in homœopathy had much faith in shaking their medicines, but had never suspected that it would be of any use in photography. He should, however, try it, and report results.

Mr. Bashford assured the members that there really was no doubt about the effects of a good shaking, and said that if any one failed to get the desired result and would bring the sample to him, he should be glad to let them see the thing done.

The usual distribution of photographs by ballot then took place, the pictures being the gift of Mr. Alexander Nicol, and consisted of a lot of extremely fine portraits of children going to, at, and returning from, the well, for which he received a vote of thanks.

Mr. Tunny, on his entering the room, received a welcome after his six months' sojourn in America, and we understand that he has agreed to give, at next meeting, an account of his impressions, from a photographic point of view, of art and photography in the United States.

The meeting was adjourned till the first Wednesday in June.

# Correspondence.

THE PHOTOGRAPHIC SOCIETY OF FRANCE: MAY MEETING.—A SPECIMEN OF NIEPCE'S ENGRAVING.—THE AUTOTYPE COMPANY'S PHOTOMETER.—BLUE GLASS IN LENSES.—IVORY-SALTED PAPER.—NEW APPARATUS FOR DRY PLATES.—PHOTO-ENGRAVING.—PHOTOMICROGRAPHY.—MUSIC PRINTING.

The Photographic Society of France held its monthly meeting on Friday evening last, the 7th instant,—M. Davanne in the chair.

The meeting was remarkably well attended, which I am happy to be able to announce, as the statement lately made that amateurs were becoming fewer numerically is not true—at least as regards France. The country that produced such men as Daguerre, Niepce, &c., and which was the birthplace of our art, must not and ought not to lower its standard, but labour on towards perfection. To my own knowledge, far from diminishing in numbers amateurs are getting more numerous every year.

M. Davanne informed the members that he had the pleasure to state that M. Forest had presented to the Photographic Society of France a very valuable and rare work of Niepce's, which was a plate engraved by Niepce by his bitumen process. But what gave more value to that work was a dedication on the back in Niepce's own writing, which states that the engraved plate was presented by Nicephore Niepce to Daguerre. A vote of thanks was awarded to M. Forest for his valuable and interesting present, which would be carefully preserved in the archives of the Society.

M. Franck de Villecholle forwarded to the Society the photometer of the Autotype Company, but the general opinion was that the photometer invented by M. Leon Vidal was much superior.

M. Berthiot laid before the Society for examination by the members present two photographic lenses—one for portrait and the other for landscape work. The new feature in these lenses is the facility for interposing coloured glass during exposure. M. Berthiot has made it his daily study to find the exact position the coloured glass must occupy in order to give the best effects. He says that the best place is between the two lenses. It appears by the numerous proofs laid before the Society that the interposition of a blue glass does not affect in the least the rapidity of the exposure, but imparts a general softness to the whole negative; therefore a blue glass placed between the two lenses would only render service when the high lights are too abrupt. M. Berthiot, in his multiplying landscape lens, has utilised a very good idea, which is that all his extra lenses are made to screw one upon the other, so that they can be placed in a little brass box and carried in the pocket.

M. Ribéra distributed to the members a sample of a new paper which he calls "ivory-salted paper," and which, it is said, possesses many advantages over the albumenised papers generally employed. At the present time, when public attention is drawn to fatty ink and carbon printing, not much attention is given to the almost ancient method of printing with silver salts, however good the paper may be. The spirit of progress pushes us onwards; we cannot return to Niepce's bitumen process; no more can we lose time in experimenting upon paper intended for printing with silver salts, which has now begun to be thought a thing of the past.

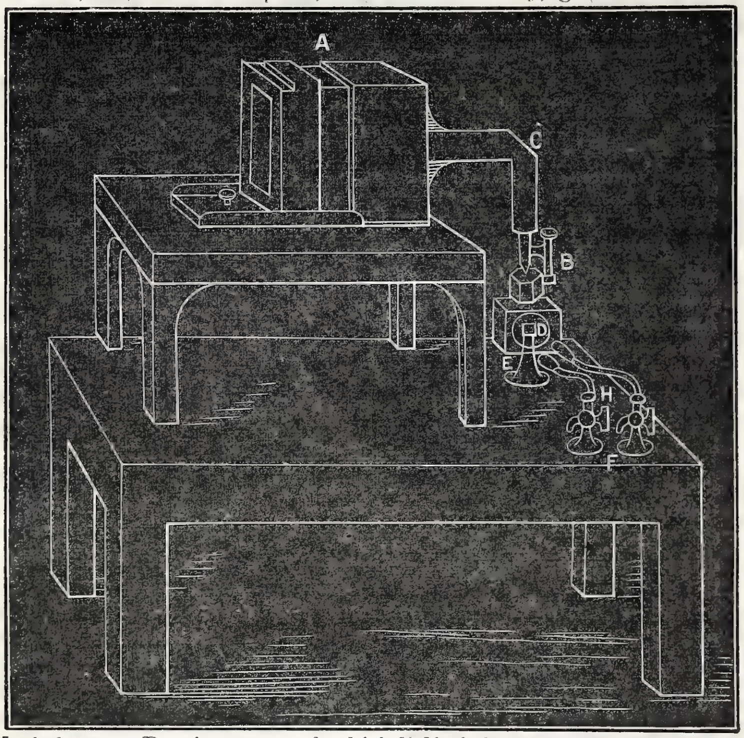
M. Geymet, whose inventive mind is so fruitful, brought before the Society another apparatus for dry collodion. Plates two and a-half inches square are employed. The instrument is focussed like an opera-glass. A changing-box containing fifty dry plates is separated from the camera. Great ingenuity is displayed in the invention, and tact in its construction. The camera is well made, and the aperture in the changing-box is only opened when the camera is pushed into its place, the latter acting as a key. The plate slides easily from the changing-box into the camera, and *vice versâ*. It is a very elegant little apparatus, but rather too small for amateurs generally, as I have always found that they object very much to having to take the trouble of enlarging such negatives.

M. Rousselon, of the celebrated firm of MM. Goupil, forwarded to the Society a collection of magnificent proofs obtained by his new photo-engraving process. On my return from a short visit to Old England it is my intention to visit that establishment to see if, peradventure, I can discover anything useful or interesting to lay before the readers of The British Journal of Photography.

M. Aimé Girard gave an ocular demonstration of his photomicrographic apparatus, which he employs to aid him in his public lectures

at the Conservatory of Arts and Manufactures, Paris. He requested to be forgiven for having been so long in fulfilling his promise to the Society. "Better late than never." The apparatus is very conveniently arranged, because the operator has everything under his control. Simplicity is the great *desideratum* in an instrument of precision, and M. Girard has succeeded in making his at once simple and convenient. Before he commenced his explanation he said that he wished to impress upon his hearers the simple fact that nothing was new in the instrument then before them. It is said that there is "nothing new under the sun;" but honour is always due to a man who is intelligent enough to make use of the knowledge even of others—that is to say, of the knowledge left as a heritage to the public by the learned and good who have preceded us, but who are now no more, and the fruits of whose studies would have been lost and their works buried in oblivion had not some one taken advantage of what they had discovered.

The apparatus is constructed in the following manner:—A, camera obscura, eight inches square, with wooden body, ground glass and




dark frame. B, microscope, of which half of the tube can be unscrewed to permit of a tube of larger bore being placed upon it. C, a silvered mirror, placed at an angle of forty-five degrees, which reflects the enlarged image on the ground glass of the camera. D, a lens employed to condense the light on the small mirror of the microscope. E, apparatus for lime light. F, cocks for controlling the supply of the hydrogen and oxygen gases.

The operator on sitting down has the whole instrument within his reach. He arranges his apparatus in a convenient manner to receive either natural or artificial light (M. Girard prefers the latter, it being more stable and more under control than sunlight) upon the small mirror under the platform which supports the preparation. The enlarged image is now focussed on the ground glass; a wet or dry plate is then introduced, exposed, and developed; the negative is now either printed or a positive made for projections.

The meeting terminated by M. Monteni projecting a certain number of proofs on a sheet. M. Girard informed the members that these proofs were made with a view to detect adulterations of flour, &c.

During the evening I had the pleasure of conversing with several of the members, who expressed their satisfaction with The British Journal of Photography. Regrets were expressed for the premature decease of Mr. Sutton. The idea of the Journal giving the biography of men who had rendered service to photography was applauded. One of the members remarked that it was really strange that some English printer—whether photolithographer, photozincographer, or carbon printer—did not volunteer to illustrate the Journal free of cost, for it would be better and more natural to see photographic portraits, &c., in a Journal devoted to photography than to find engraved ones. I promised to bring the idea before my readers, although it is by no means new, for several of the photographic journals of the continent are illustrated in that manner. In some cases the printer pays, as he has found it to be an admirable mode of advertising.*

A revolution is about to take place in music printing. Every one knows that for printing music it is necessary to have, first of all, the composition lightly sketched on sheets of tin, after which it is engraved on the plate by a workman, who holds a punch in his left and a hammer in his right hand. As the design has to be transferred it is engraved reversed, which requires both an experienced eye and a steady hand.

M. Lourdel, the well-known photographer, of Paris (see advertisement in The British Journal Photographic Almanac, page cxii.), has invented a system of printing music which is so manifestly economical that it cannot fail to be rapidly adopted. M. Lourdel thought it would be a great saving to suppress the sheets of tin, which cost generally about 3s. 5d. To do this a piece of transfer paper is taken which has been previously lined and spaced. The workman has before him a composition case like a printer's, which contains in each division a tool, at the extremity of which is a musical sign. Beside him is a pad impregnated with transfer ink. He lays the ruled transfer paper before him, and with the right hand he takes the musical signs, notes, &c., inks them, and prints the paper without the slightest effort. It is simply a matter of regularity and rapidity, speed being easily acquired after a little practice. The music is then transferred to the stone and proofs taken at will.

The composition is preserved in the archives on a very thin sheet of zinc about the value of 6d., after all the necessary manipulations are completed; thus for each sheet of music only 6d. will be involved, whereas formerly music publishers were almost ruined by the immense sums of money laid aside in stock. E. Stebbing, *Prof.*

3, *Place Bréda, Paris, May* 11, 1875.

## EMULSION PROCESSES.

*To the* Editors.

Gentlemen,—In your article which refers to my strictures on Mr. M. Carey Lea's new process, &c., you speak of my having condemned it on theoretical grounds, which is, in a double sense, incorrect, as I have not condemned the process at all, but have simply expressed an opinion that it would be found to be no improvement on the bromide emulsion; and this opinion I based on the fact that in all my collodion experiments any given combination of salts in an emulsion has exactly the same value in reference to the action of light that it has in a bath preparation, and that any addition of iodide to a bromide reduces the sensitiveness *somewhat.* This opinion I stated was confirmed by experiments made by experimentalists of my acquaintance, and by your own, as stated in The British Journal of Photography.

I do not, and did not, say that it was impossible that it should be quicker than a bromide, "but that it requires nicer calculation than Mr. Lea seems to give to prove it." This I hope we shall have from Mr. Cooper, whose care and systematic method of investigation have long made him an authority of the first weight in all that relates to dry-plate photography. I should accept the result of his trials with complete confidence; but I doubt whether we should find him making use of so vague and useless a standard of sensitiveness as the time required to make transparencies by uncertain gaslight with negatives of variable densities. Every practical photographer knows that the comparison of rapidities is a most delicate matter, and that there are few days in the year when exposure of two plates, one after the other, would be *certain* to give the same effect in the same number of seconds. I have done a great deal in this way, and the only certain method of comparison I know of is that which I have adopted—to have a holder capable of taking, side by side, the two plates to be compared, and then, with a partition in the camera, exposing them simultaneously to the action of a pair of twin lenses kept carefully clean and proved to be equal in power. What value, then, can we attach to experiments in which, as in one Mr. Lea reports, he compares an exposure to gaslight in Philadelphia under one negative with one made in London under another? To a careful comparative experiment made by Mr. Cooper or yourselves I defer readily; but how can anyone accept a judgment based on such premisses?

With regard to the "question of priority of discovery in emulsion matters" I have only to say that *I* put in no claim for discoveries of any kind, and compete with no one; but I put in the protest of common sense against complicating photography and claiming credit for discovery therein. If Mr. Lea's new discovery be one which on such trial as he does not report having made for himself shall be found to be valuable, that will be the time to acknowledge it. So far I do not see the justification, and as I have no conflicting claims to be thrown out I am perfectly indifferent. My only aim and desire is to make photography as simple

* We should be happy to carry out this idea, but we are afraid our artistic friends would find it too expensive to supply the large number of prints which would be required.

and certain as possible, and to make dry-plate work as sure and good as wet, or even surer and more convenient; and if Mr. Lea's discoveries lead to this end I am as ready to admit his claims as those of anyone else. That Mr. Lea is not so is an impression which I cannot help drawing from his studious avoidance of mention of the researches of others. In the case which you allude to in the number for May 7 no one would imagine that I had treated the subject of specks fully, and shown that the origin of these spots was chemical dust—not always hyposulphite, but soda or any alkali, and, in general, substances which have either reducing or the contrary effect—and that I had shown how comets may be produced by the same causes as well as opaque spots, which Mr. Lea does not include in his researches. But that Mr. Lea "*thinks* I have *somewhere* made the same suggestion" is all that he can find to say on the subject.

As to the merits of the question of the new form of emulsion, the point of sensitiveness I shall soon be able to answer absolutely. With regard to that of halation I can reply at once. With a properly-prepared Bolton emulsion there is no halation when the amount of silver is raised to twenty-five grains of nitrate per ounce. I send you four negatives, taken on a brightish day last week, which received in rapid succession the exposures of 15, 30, 60, and 120 seconds, and a print 8 × 8 from another, made by an exposure of twenty-five minutes on the same subject with the same lens (six-inch Ross's symmetrical) with the smallest stop, the others being taken with the largest. In the four negatives there was no backing at all. On that from which the print is taken (I do not send the negative only on account of its size) I backed one-half the plate vertically, and I defy any one to tell me, from the print or the negative, which side was backed; and this emulsion has only fifteen grains of silver nitrate per ounce. The thirty seconds' exposure was sufficient, and the subject as trying as could be (not being an interior), as the edge of a red roof in shadow in the centre of the subject cuts against the bright sky, and there is no blurring whatever. So much for the value of the iodide in blurring.

In confirmation of what I have said of Mr. Lea's faulty formula, compare it with Mr. Cooper's, the latter using nine grains of *crystallised* bromide and twenty-five to thirty of silver nitrate, and giving an intelligible indication of a method of ascertaining the sufficiency of the silver by showing that when a certain amount has been added the emulsification becomes complete—a rule which simplifies the whole matter enormously.

If on careful experiment there be any advantage in Mr. Lea's addition to Mr. Bolton's process I shall be glad to give him all the credit due; but if none appear beyond avoidance of the backing I shall only class it with the complications which bring no advantage to compensate for the loss of simplicity in the formula.

With regard to the preservative soaking I consider it simply as an expedient to remedy the defective quality of the pyroxyline. Mr. Phipps showed long ago that, with a proper cotton, no preservative was necessary. Where this cannot be obtained tannin is an addition; and, as Major Russell long since showed that washing away the tannin did not remove its chemical effect, it was the most natural thing to suggest itself to the experimenter with the washed emulsion to be applied to the mass of emulsion, and it had been used so by me more than a year ago; but, as I have stated before, it invariably diminishes sensitiveness, and for work of the kind which best meets the artistic sense—that which most resembles wet collodion—the tannin, even used in this way, is an injury, as tending to hardness. If added to the emulsion as I have recommended care must be taken to ascertain that it is neutral to test paper, common samples of tannin being generally very acid.

The effect of gallic acid is much less objectionable; but plates prepared with it will not retain the image long before development.

On the whole, I think that most amateurs on trying all the modifications in preservative will find the addition of a grain of neutral tannic acid to an ounce of redissolved emulsion to best meet the average requirement, when the pyroxyline does not give that required without any preservative. Part of a grain of gum ammoniac to the ounce will greatly promote adhesion and assist the action of the developer.—I am, yours, &c., W. J. Stillman.

*Merstone, Isle of Wight, May* 8, 1875.

[In our article last week the statement that Mr. Stillman condemned the chloriodo-bromide process on theoretical grounds was made with a reservation—"if we understand him (Mr. Stillman) rightly." After the explanation given above we can only repeat that we think Mr. Stillman does *virtually* condemn the process in theory in saying that it will "be found no improvement on the bromide emulsion," as Mr. M. Carey Lea specially claims for it decided advantages over anything previously published. In our own experiments (which, though performed with every possible care, we do not look upon as conclusive), without attaining the full measure of rapidity spoken of by Mr. Lea, we found the introduction of iodide into the emulsion to confer properties which caused us to look hopefully for greater results at some future time. We are glad to find that Mr. Stillman and Mr. H. Cooper are now engaged in similar experiments, and doubtless the value of the process will ere long be placed beyond cavil. We are at present engaged on a series of comparative trials as to the respective merits of the chloriodide and simple bromide emulsions; but, as Mr. Stillman remarks, this is a matter which requires much time, care, and attention if a reliable result be expected. As regards the prevention of halation, the print which Mr. Stillman has sent us fully bears out what he says of it. Though we have submitted it to the closest examination possible we have been quite unable to detect the slightest sign of halation or any evidence whatever that the two halves had received any different treatment, and this in spite of the most trying circumstances, both as to subject and length of exposure, under which the negative was taken. The negatives referred to by Mr. Stillman are very remarkable as tending to show the great degree of latitude allowable in the exposure; and on this account alone we invite those interested to examine them at our editorial office, where they may be seen. The closest inspection by ourselves and friends fails to discover any halation; but we have already, in an article published two weeks ago, stated that plates prepared with this emulsion require no backing. We regret that Mr. Stillman should have expressed himself so strongly *before* having made his promised experiments, an account of which we shall be happy to receive when completed, feeling sure that, whether the use of iodide should prove to be a "needless complication" or not, some good must inevitably come out of the matter. In another column will be found a second communication from Mr. Cooper, with details of further experiments, to which we direct attention.—Eds.]

## WHAT CONSTITUTES A DISCOVERY OR INVENTION?

*To the* Editors.

Gentlemen,—We have recently had considerable discussion on priority of discovery, and it is probable that at no distant date we may treat ourselves to more.

Such discussions would have been in the past, and will be in the future, more profitable if conducted on a well-defined understanding of the terms "discovery" and "invention."

I respectfully invite Dr. Nicol, Colonel Stuart Wortley, Canon Beechey, and Mr. M. Carey Lea to submit their definitions of the terms, so that we may, at anyrate, have the law to point to when we find it necessary to discuss again.—I am, yours, &c., D. W.

*Blackpool, May* 8, 1875.

## *AURA POPULARIS.*

*To the* Editors.

Gentlemen,—The "Peripatetic Photographer" does me a great injustice in your last issue, I complained of one or two *writers* who try to gain distinction by taking the ideas of others and writing themselves into notice by that means. He says some consider this an insult to *photographers*.

Having worked and written for very many years in the hope of giving some little help towards the advancement of photography, I do not believe that any photographers will be so unjust as to be led by the "Peripatetic;" but I feel, nevertheless, his unfair attempt to raise a prejudice. I would have written at greater length, but all my spare time is occupied in an entirely new application of photography which I am working out.—I am, yours, &c., H. Stuart Wortley.

*Rosslyn House, Grove End-road, N. W., May* 11, 1875.

[It is to be regretted that Colonel Wortley did not, in the letter from which the "Peripatetic Photographer" gave a quotation, limit his complaint to the "one or two writers" who, he now says, try to gain distinction by appropriating the ideas of others. What he really said, however, was that "more distinction is to be gained nowadays by simply taking what another has previously published, and writing a long article, ignoring the previous worker." Reading his former letter in the light thrown upon it by the present one we and every reader of, and writer in, the Journal will cordially endorse the sentiment now enunciated, viz., that it is grossly unfair in anyone to attempt to build up a reputation, or gain distinction, by a mere reiteration of the ideas of others. But "borrowed plumes" are rarely adhesive, and under the action of time and the incisive atmosphere of criticism they drop off more or less speedily. We may here state that we have received several communications on this subject, but as that of the "Peripatetic Photographer" was a fair type of the whole we published it only.—Eds.]

Trade Catalogue.—We have received from Messrs. Watson and Son their new catalogue of new and second-hand photographic lenses, cameras, and apparatus. The variety of these is indeed very great, among the lenses being many of the best kind by the first makers. From this and similar catalogues we have seen we conclude that the trade in second-hand lenses is becoming a very important one.

## EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at the small cost of one shilling in our advertising pages. This column is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

Three $8\frac{1}{2} \times 8\frac{1}{2}$ double dark slides, and one single ditto, quite new, offered in exchange for other photo. requisites. A good lens preferred.—Address, R. Pringle, 19, St. James's-square, Edinburgh.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

Photographs Registered.—
Wm. Vick, Ipswich.—*Two Portraits of the Rev. Granville Smith.*

W. E. Batho.—Received. In our next.

J. S.—*Humphrey's Journal* ceased to exist several years back.

Trovatore.—The second of the methods of printing transparencies on your list is the best of the four.

S. J. W.—Nitro-glucose is not sold in London; hence no course remains for you but to make it yourself.

Verax.—The dark slide is very ingenious, but we do not think that you would have much chance of introducing it commercially, because while it does not possess any advantage over those at present in use it would cost much more in its construction.

W. Angus.—Your suggestion is ingenious, but we fear it is somewhat impracticable. By sweeping the floor of the dark room carefully in the evening after work is over, and watering it lightly two or three times during the day, all danger from dust will be avoided.

J. S. T.—We cannot offer any opinion respecting the merits of the various samples of pyroxyline you send, for the only way by which the quality of pyroxyline can be tested is by making it into collodion and then iodising it, which you obviously cannot expect us to do under the circumstances.

B. Wheeler.—A meniscus lens may be achromatised in two ways—either by means of a bi-concave flint combined with a bi-convex crown, or by a meniscus of crown combined with a concavo-convex (or negative meniscus) of flint. The latter form is that which was introduced to public notice by Mr. Grubb under the designation of the "aplanatic" lens.

Amateur.—The bath has failed simply from exhaustion. It is likely that if you test its strength it will not be found to be much stronger than ten or twelve grains to the ounce. It is not reasonable to expect that a negative bath will keep in good working order if never strengthened. If you add about an ounce of crystallised nitrate of silver to it all will go on well as before.

D. S.—The picture enclosed is produced by the eburneum process of the late Mr. Burgess. A thin transparency is made upon glass, which is then carefully levelled, and a quantity of an emulsion composed of gelatine and sulphate of barytes poured upon the surface, in such a quantity as when dry to be of the thickness of thin card. This, when quite dry, is stripped of the glass, when the transparency will be found attached to the latter.

W. J. P.—The lens is quite good, and in the hands of an experienced person would give pictures free from distortion. Place a spirit level on the top of your camera so as to ensure its being made perfectly level, then slide the lens up towards the top of the camera (we assume that it has a sliding front) until you get all the building shown; use a small stop, and you will then obtain pictures perfectly free from the defect of which you complain.

A Man of Kent.—Your lens has certainly a very curved field. This we think might be rectified by introducing much more negative spherical aberration into the back lenses, to effect which the two sides of the posterior crown glass lens must have the radii of their surfaces a little more nearly approximated than they are at present, taking, so to speak, a little from off the most convex side and putting it on to the other. This will flatten the field. The distance between the front and back lenses will probably have to be readjusted.

T. S. S., Jun.—You are mistaken in your estimate of the tannin process. It is possible to produce by it pictures of the highest class; we have certainly never seen by that process any negative produced which was not many degrees superior to the collodio-albumen negative you have forwarded. But we know, too, that the last-named process is also capable of producing negatives of the highest class, although, with all deference to your opinion, we do not think you have yet attained as much success as you are likely eventually to do after having acquired more experience.

M. A.—Several salts have been proposed as substitutes for chloride of gold in toning. We recollect that nitrate of bismuth was proposed for this purpose many years ago, but have never either tried it ourselves nor are we aware of any who have done so. If you feel inclined to make the experiment you can prepare the salt very easily by dissolving bismuth in nitric acid in the proportion of an ounce of the metal to three ounces or more of the acid. To the solution thus obtained add half its volume of distilled water, filter through powdered glass, and evaporate until crystals form.

H. Knowles.—Of the three lenses of the maker named, the "universal" will be best adapted for your purpose. We speak of it only from the printed description, without having tried the instrument.

W. W.—The causes of pinholes are so numerous that we might suggest several as applicable to your case without any of them being the true one. See an article on the subject in the Journal of April 16th, page 182.

Paddingtonia.—Seeing that the negative varnish is absorbed by the collodion film to such a degree as to dry flat and dull it is evident that it is rather too thin. There are two ways by which this defect can be remedied. One is to leave the cork out of the varnish bottle for a short time to allow some of the spirit to evaporate, and thus bring the varnish to a proper degree of consistency; the other and better way is to thicken it by dissolving in it a little more of the lac or whatever other gum may have been used in its preparation. There are several formulæ, of great value, for making negative varnish given at page 175 of our Almanac for the present year. These possess slightly different characteristics, but all of them are good. One of them we know to have been manufactured and sold at a pretty high price.

Photographing Tombstones.—In reply to "J. W. B.," who wrote on this subject in our last number (see "Answers to Correspondents") Mr. F. York favours us with a brief communication. He says:—"Cemeteries are generally private property, although thrown open to the public at certain hours. The authorities will not sanction the photographing of a tomb without the written authority of the owner. If a person take a photograph clandestinely and offer it for sale he renders himself liable to an action for trespass. These are the regulations of the London cemeteries." Another correspondent says "J. W. B." must be very unwise to attempt to do a thing he has been cautioned not to do. He would be made to give up all the negatives and prints and to apologise, in order to prevent a lawsuit.

☞ Editorial Communications should be addressed to "THE EDITORS"—Advertisements and Business Letters to "THE PUBLISHER"—at the Offices, 2, York street, Covent Garden, London, W.C.

A Warning to Photographers.—A case of some interest to photographers was tried in the Kingston County Court on Friday last, the 7th instant. In the case of Fry *v.* Kamphausen, Mr. S. Fry, of Surbiton, sued the defendant to recover the value of silver cuttings, chloride, &c. Defendant, who calls upon photographers for the purpose of collecting residues, called on Mr. Fry in August last and took away silver cuttings and chloride, promising to remit the value, but this he failed to do. A verdict was given in favour of the plaintiff, and an order made for immediate payment. We direct the attention of photographers to this case.

Utilising Photozincography.—A Saxon charter, which was exactly 900 years old last year, is reproduced by photozincography in the last report of the Ordnance Survey Department. Its fine, bold writing is perfectly preserved. By this charter King Edgar made a grant of three plots of land at Copplestone, about twelve miles north-west of Exeter, to his Thane or Duke Ælphege. The King's signature heads the list, to it being joined that of his Queen, Ælfthryth, and then follow those of Dunstan, Archbishop of Canterbury; Oswold, Archbishop of York; the rest of the bishops, and a number of abbots and ministers. The text, of course, is in Latin. Speaking of these ancient charters, Major-General Sir Henry James, the Director-General of the Ordnance Survey, states that they were, and are now, locked up from any save the antiquary; but on his recommendation the government are "considering the desirability of publishing *facsimiles* of a series of them, containing most interesting information about persons and places, which would thus be thrown open to the general public."

## METEOROLOGICAL REPORT,

*For the Week ending May* 12, 1875.

Observations taken at 406, Strand, by J. H. Steward, Optician.

These Observations are Taken at 8.30 a.m.

| May. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 6 | 29·79 | SW | 54 | 57 | 69 | 54 | Dull |
| 7 | 29·59 | WSW | 49 | 52 | 58 | 48 | Cloudy |
| 8 | 29·83 | W | 55 | 57 | 63 | 51 | Cloudy |
| 10 | 30·09 | W | 53 | 56 | 67 | 51 | Dull |
| 11 | 30·42 | SW | 48 | 53 | 70 | 46 | Cloudy |
| 12 | 30·35 | W | 50 | 55 | — | 49 | Fine |

CONTENTS.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 785. Vol. XXII.—MAY 21, 1875.

## THE COMPARATIVE MERITS OF MOIST AND DRY PROCESSES.

A series of experiments, undertaken with a view to ascertain the value of the "moist process" (introduced by the late Mr. Sutton about two years since) as compared with the wet collodion and other processes of recent introduction, have just been brought to a close, and we shall now give such a description of the process in question as will enable our readers, with a certain degree of precision, to ascertain to what extent and under what circumstances it is likely to prove useful to them.

Moist, in contradistinction to *dry*, processes—in which the film is quite desiccated—are now of respectable antiquity. As soon as the great advantages of the wet collodion over pre-existing processes had been perceived, and it had been ascertained that these advantages—especially in respect of sensitiveness—were inseparably associated with the wet state of the film during exposure, suggestions mere made of methods by which the collodionised surface of the glass might be retained for a considerable period in a state more or less humid. One of the earliest proposals of this character emanated from Messrs. Spiller and Crookes, who suggested washes of deliquescent salts, such as the nitrates of zinc and of magnesia, by which desiccation of the film would be entirely prevented. Succeeding these suggestions—which did not seem to find favour with photographers—came the honey process of Mr. George Shadbolt, which was extensively used and subjected to several modifications upon the nature of which we need not here dwell. *Dry* processes began then to be better understood, and moist ones were laid upon the shelf, from which, at occasional intervals, they have been brought down for careful introspection.

Glycerine gave promise of becoming one of the most valuable materials to aid in the preparation of plates by a moist process, for it possesses the valuable property of mixing freely with various bodies without undergoing change or decomposition. Unctuous and emollient, it is freely miscible with water; and while in this state it softens bodies in a manner somewhat similar to oil, doing so without greasing them. As it does not evaporate or change by exposure to the air it was to be expected that a substance of this kind would lend powerful aid in the endeavour to retain photographic plates in a moist state; and many years ago this aid was invoked. The glycerine process was once well known and somewhat extensively practised, but of late years it has fallen into a state of desuetude. Somewhat more than two years back Mr. Sutton revived this process in a form greatly modified as compared with that previously practised.

The glycerine process pure and simple consists in collodionising and exciting a plate in the usual way, and then coating it (without washing) with a preservative composed of glycerine, honey, nitrate of silver, and water. This is placed in the sun, kaolin having been previously added, and is shaken up at frequent intervals until the liquid ceases to give a black deposit. The clear solution is poured over the plate upon its removal from the silver bath, and, subject to such favourable conditions as the collodion being "ripe," a plate thus prepared will remain good for three or four hours or even longer.

The latest modification of this process was that published by Mr. Sutton, who recommended that the plate should be washed after removal from the bath and previous to applying the preservative; and, further, that the preservative should consist only of glycerine, albumen, and water. We have seen, and noticed editorially, several negatives of most excellent quality obtained by Mr. Sutton on plates thus prepared, and have, as we have already said, given the process a thorough trial so as to be enabled to offer some advice on the subject.

We start with the ordinary appliances of every studio, namely, ordinary commercial collodion and the usual nitrate of silver bath. Up to the removal of the plate from the exciting bath there is no deviation from the ordinary routine of the wet-plate portrait photographer. At this stage the first departure from wonted usage is made—the plate is washed in water so as to remove all the nitrate of silver. It is then subjected to a wash of glycerine, albumen, and water, after which it is placed in the plate-holder for exposure. The novelty in the course adopted here refers to the washing of the plate previous to applying the moist preservative and the mixing of albumen with the glycerine.

After trying several mixtures of albumen and glycerine in various proportions (forty-eight plates having been prepared, exposed, and developed in the course of these experiments) we found the best results to be obtained by a preservative composed of—

| | |
|---|---|
| Glycerine | 6 drachms. |
| Albumen | 1 ounce. |
| Water | 2 ounces. |

To the above we added two drops of ammonia. We do not say that these are the best proportions of the ingredients; we only say that of all the various proportions we have yet tried the above gave us the finest results. Mr. Sutton makes no mention of the addition of ammonia, but we find it an improvement. Having, after numerous experiments, decided that the above were the best proportions in which to mix the preservative, we then finally prepared a few plates for the purpose of being tested against some others, and we can describe the results better by saying a few words concerning each of eight negatives now lying before us than by pages of abstract writing.

The eight plates were all prepared at one time, about nine o'clock in the evening, and were exposed and developed one after the other, as rapidly as possible, the following morning, the exposures being made between half-past six and seven o'clock. The subject is a portion of a partially-illuminated building, a large mass of laurels in the middle distance, a grassplot in front, and a few houses in the extreme distance. The instrument used was a single lens of six inches focus and a half-inch diaphragm, represented by $\frac{f}{12}$. No alteration was made in camera, diaphragm, or lens during the exposure of the whole of the plates, and, so far as we could estimate, the light was quite uniform during the whole period of exposure. Now for the details.

Plates Nos. 1 and 2, prepared by the above formula, received exposures respectively of thirty and sixty seconds, and the development was that suggested by Mr. Sutton, namely, a slight rinsing with water and an application of "acid pyro. and silver," which in this instance was composed of three grains of pyrogallic acid and two of citric acid to the ounce of water. Two or three drops of nitrate of silver were added previous to applying this to the plate.

The negatives resulting from this treatment are exceedingly strong, the high lights and skies are very dense. No. 1 produces the most effective print, but in No. 2 there are details visible in the deeper shadows which cannot be seen in the other. The character of both negatives is as if they had been intensified either by chloride of platinum—although the blacks are somewhat warmer than if intensified by this agent—or by a solution of bichloride of mercury, followed by treatment with cyanide of potassium or of sulphide of ammonium.

To plates Nos. 3 and 4 we gave, relatively, a briefer exposure, the former receiving twenty and the latter forty seconds' exposure. These we developed by a method quite different from that suggested by Mr. Sutton; for, after pouring over their surfaces a little common water so as to wet them thoroughly, we applied a plain four-grain solution of pyrogallic acid without anything else whatever. The details were not long in making their appearance, and in both cases, when nothing more seemed to come, we intensified the feeble image brought out by the plain pyrogallic acid by the addition of one or two drops of a solution of nitrate of silver and citric acid. Under this treatment the images grew rapidly in intensity. Comparing one of these pictures with the other we are enabled to say that the one which received the forty seconds' exposure is rather overdone, the other being much the better of the two. Comparing the two latter with the two former plates we find that there are more details to be seen in No. 4, which received twenty seconds' exposure, than there is in No. 1, which, it will be remembered, was exposed for sixty seconds. The conclusion to be drawn is most obvious—the best way to develope a plate of this kind is to commence by the application of plain pyrogallic acid solution, and then to intensify the details by an addition of citric acid and nitrate of silver to the developer. The latter negatives are very clean in all their details.

Negatives Nos. 5 and 6 were obtained by means, not of Mr. Sutton's suggested preservative, but of one we received from Dr. George Kemp in 1868. The label on the bottle bears the inscription—"Honey and glycerine preservative, from virgin honey from the comb, prepared August 8, 1868." The peculiarities of this preparation were referred to by Dr. Kemp in his article in our ALMANAC for 1869; but, although in a private letter he expressed his belief that the preservative would keep for some time, he could scarcely have anticipated that so many years afterwards we were to use the self-same solution prepared by him at the above-mentioned date, and in a trial with recent processes the preservatives used in connection with which were prepared only a day or two in each case before being used. We introduced an important modification before applying Dr. Kemp's preservative; for, instead of pouring it on the surface of the plates drained but not washed, after their removal from the silver bath we gave both plates a thorough good washing, after which the preservative was applied. The relative exposures of the two plates thus treated were twenty and forty seconds, and the development was by the acid pyro. method—the same as that employed with Nos. 1 and 2. These plates were not nearly so harsh or strong as the first-mentioned ones developed in the same way. The films are very glossy, reminding one very much of albumen; whereas in all the previous negatives the film is slightly matt when viewed by reflected light. No. 5, which received the exposure of forty seconds, is overdone; No. 6 is much better in this respect.

Examining these six negatives under the microscope we find that the structure of the image varies considerably, although the same collodion and bath were employed in all cases. Nos. 3 and 4, which were developed by plain pyrogallic acid, exhibit more granularity in the deposit of silver of which the image is composed than do Nos. 1 and 2; while Nos. 5 and 6 are much finer in this respect than any of the others.

Two plates more remained to be tested, and these were prepared by one of the most recent modifications of the collodio-bromide process, by the same washed emulsion to which we recently referred [*ante*, page 207]. The preparation of these plates was effected in the simplest manner conceivable. The emulsion was poured on, the plates were put aside to dry, and—that was all. The relative exposures given were twenty and forty seconds. It will have been noticed that all the other plates were moist; Nos. 7 and 8 were quite dry. These we developed in the way we always prefer to adopt with plates of this description:—A three or four-grain solution of plain pyrogallic acid is poured over the surface (which must previously have been made wet with methylated spirit of wine and then rinsed with water), by which means the image is brought out, although somewhat feebly. A drop or two of solution of bromide of potassium, with a like quantity of greatly-diluted ammonia, is now added to the developer, which causes further details to become visible and, at the same time, gives great force and vigour to what has already been developed. In respect of quality the last two negatives were infinitely superior to all the others. Although one received precisely double the exposure of the other both are good negatives, the colour of the image being a fine non-actinic, warm brown.

"Under what circumstances, then," it will be asked, "is the moist process likely to be of utility?" We reply: it will be very useful to professional photographers, the great majority of whom are somewhat unacquainted with dry processes. If any of them have an order to execute at too short a distance from home to warrant the taking out of a tent and wet-plate appliances, while it is too far away to justify their trusting that a wet plate prepared at home will keep quite good till their return, then the moist process will prove very useful under such circumstances. Let the plate be sensitised, washed, and coated with the preservative, and it is certain that a good negative will be obtained within a few hours afterwards, due care being taken with the exposure and development. In obtaining a negative in this way nothing will be required—the preservative solution alone excepted—that is not to be found in everyday use in the portrait studio. For interiors or subjects requiring very long exposures the moist process will prove invaluable; for, whether the exposure required be a minute or an hour, or whether the plate is to be exposed within a few minutes or a few hours of the time when it was prepared, it is all the same. No special description of collodion or exceptional nicety of the bath is necessary, for the plates will develope free from fog. We have only to add one remark by way of caution—see that the plates are thoroughly well washed before applying the preservative.

We frequently receive letters from correspondents who are engaged in copying engravings and drawings for photolithographic and similar purposes, and who complain of a difficulty in obtaining density in their negatives without blocking up the finer lines of the subject. To those composing this increasing class we say—try the moist process with acid pyro. and silver development, and no cause of complaint will hereafter be found. One of our experiments was made on a subject of this kind, and although a wet plate prepared by the same collodion and bath gave a feeble negative, yet, when a similar plate washed and "preserved" was exposed on the same subject two hours after the preparation of the plate, the resulting negative was intense to a very unusual degree.

For ordinary landscape work, as well as for general utility, we unhesitatingly express our preference for dry plates. While equally certain and as equally sensitive, when compared with moist plates they possess two additional advantages; and we here refer more particularly to the process by which the plates (Nos. 7 and 8) alluded to were prepared—that is, the dried and washed emulsion process. The first advantage is that a dozen plates can be prepared in the time required to prepare three plates by the moist method. The second advantage is that when once the plates are dried and stored away there is no limit (within reasonable bounds) to the time they will keep; they may be exposed the same day, the next day, or the next week or month. We have only to add that, the surface being quite dry instead of tacky, dust does not adhere, as in the case of moist plates; while, to sum up all, the quality of the negatives thus obtained is quite equal, at least, to that of moist plates.

## COMPLICATIONS IN PHOTOGRAPHY.

An article in our issue of May 7, from the pen of Mr. W. J. Stillman, induces us to consider what may be called "complications" in photo-

graphic processes. As a matter of course simplicity should be, and doubtless is, the aim and end of all photographic experimentalists; but at the same time it is necessary to bear in mind the fact that quality of results is more to be sought after than mere ease of manipulation. It frequently happens that a complicated method of working is introduced as an improvement upon previously-known processes because it possesses some special advantage not hitherto attainable.

When Archer first began to experiment with collodion as a substistute for paper for photographic purposes—or, we should say, in his first published directions—he recommended a mixture of dry iodide of silver and collodion, which, after coating the plate, required to be dipped for *a few seconds* into a solution of nitrate of silver. We can scarcely in these days comprehend the utility or even feasibility of such a process; but it was undoubtedly the first step towards the present stage of photography. It was not long, however, before a simply iodised collodion in connection with the silver bath came into general use, and increased care in the management of the silver solution became necessary. Here we may begin with our list of "complications." But who, nowadays, will be so bold as to say that the complication was not an advance? Surely the gain in results was at least equivalent to the slight extra trouble entailed in keeping the bath in order.

Next we come to the introduction of bromide into the collodion. It has been said that simply iodised collodion when used wet is much more sensitive than any other. Why, then, complicate matters by the introduction of any other salt? Simply because, as use has now taught us, we gain greater freedom from fog, stains, and many other defects inherent in the old process in addition to other advantages better understood than described. Next we mention the use of iron as a developer, which may be considered a complication on account of the necessity, in the majority of cases, of a second intensification. Yet who will deny that it was a great gain.

Turning to dry processes we come to what may be fairly considered, in the first instance, a decided complication as compared with the use of wet plates; but the gain in convenience for out-door work is so considerable as to quite counterbalance the extra trouble in preparation. The various albumen processes, though undoubtedly very complicated as regards manipulation, possess such qualities, both with respect to keeping and certainty of result, as to have placed them for a length of time in the front rank of dry processes, and even to this day they are able to hold their own.

Passing on to emulsion work, the original collodio-bromide process was without question a great simplification on all previous methods of working, although, in the old style of working it, it had its disadvantages in the shape of want of rapidity and a certain amount of uncertainty. Much has since been done in the way of removing these objections, and each step in that direction may be considered to some extent a complication. The solution of the silver nitrate in alcohol in sensitising the emulsion, the use of an excess of silver, and the necessary employment of a mineral acid or nitrate of uranium to restrain it were, in a certain sense, complications, but at the same time, unquestionably, improvements; for these, in connection with a better knowledge of the requirements of the process, have made it one of the most rapid, as well as reliable, of all dry processes of the present day.

The introduction of the washed emulsion or "pellicle" process was a further simplification, though necessitating some little extra preliminary trouble on the part of the operator, which, however, is amply compensated for by the saving of time and labour in the after-operations. It is to the *quasi* complications recently introduced into this method of working that we wish particularly to draw the attention of our readers.

The process as originally published, some eighteen months ago, was not suitable for use with an emulsion containing an excess of silver nitrate, and therefore failed to give the highest results as regards rapidity. We do not mean to say that it was impossible to employ such an excess, but that the chances of producing a good result were much lessened. Some time ago Mr. M. Carey Lea published a modification of his chloro-bromide process, which consisted in placing the coated plate direct in a preservative bath without previous washing. The effect of the preservative bath thus employed was to convert the free nitrate contained in the film into an insoluble organic compound in place of washing it away, as was previously the case, thus retaining in the plate the whole or the greater part of the silver in a useful state. Mr. Lea has more recently recommended the same mode of procedure in connection with the washed emulsions now in vogue; but Mr. Stillman objects to it as a "useless complication," looking upon it as merely "an expedient to remedy the defective quality of the pyroxyline." If of use in that respect only we think that the term "useless" is misapplied; for Mr. Stillman should remember that all amateurs are not able to procure without considerable trouble the exact quality of pyroxyline necessary for this process. But we look further: we believe it to be the only means by which the process can be made to work reliably with excess of silver.

With certain samples of pyroxyline the mere addition of *aqua regia* or nitric acid will be found quite sufficient; but with a defective sample (and there are many such in the market) that course would inevitably end in failure. By the use of a mineral acid and subsequent soaking of the moist pellicle in a suitable organifier we have not yet found a pyroxyline which may not be employed with success. We think it is an important matter to be able to attain the highest point of sensitiveness by the employment of an excess of silver, not only with certainty, but with any pyroxyline of ordinarily good quality. This, we believe, is done by Mr. Lea's modification.

As regards the introduction of iodide into the emulsion we cannot yet speak with so much certainty. It appears to be without doubt that the difficulty of emulsifying the silver salts is much increased by its presence; but in our last issue Mr. H. Cooper directs attention to a simple means of obviating that defect. A more important question is the one of relative sensitiveness between emulsions of bromide and of bromo-iodide. All theory points to the former as the more likely to bear away the palm in that respect, but Mr. Lea speaks most decidedly in favour of the latter.

As regards "halation," we know that a bromide film may be formed of such density as to absorb the whole of the light which strikes upon it; but from what we have seen of chloriodo-bromide emulsions and films we believe they will be found to compass the same result with a much less expenditure of silver than is the case with bromide, on account of the deeper colour of the film. Upon these three points hinges the question as to whether the introduction of iodide into emulsions is or is not a "useless complication."

The one case, which we must mention with all deference to Mr. Lea, of what we consider a complication which does not carry with it some specific advantage is the preservative which he recommends in preference to all others. It is, to a certain extent, a mere matter of taste, dependent upon the style and colour of negative preferred by different operators; but, to our thinking, the trouble of preparing so complicated a mixture, and one which, when prepared, is of such dubious composition, is not sufficiently compensated for by any improvement in the quality of the results obtained.

Since writing the above we have received a communication from Mr. Lea, which will be found in another column, in which he states his inability to understand our failure in making his albumen preservative. As we are borne out in our experience by other experimentalists, and have followed Mr. Lea's published directions to the letter, we can only imagine there must be some variance in the materials obtainable here and in America. It cannot be that the fact of keeping the various materials in solution for a length of time would make the difference.

## ON CLOUDS.

As a somewhat natural sequel to our article on photographing trees, in our number for last week, we think a few words on the introduction of clouds into our landscape pictures may at the present time prove useful. We may, however, premise that we have nothing very new to say on the subject; but, judging from the very few photo-

graphers, especially amateurs, who seem to do anything in this way, we are convinced that the ease and simplicity, and we may add certainty, with which remarkably fine effects can be produced seem not to be by any means so generally known as should be the case by our brethren of the camera.

It is quite true that under certain circumstances, when working with wet collodion, very fine natural clouds may be obtained on the same plate and by the same operation as the general landscape; but such cases are certainly very rare, and much more exceptional still are the cases in which they can be got on dry plates. We do not, of course, now so often see the pure white skies which in the early days of photography charmed our operators; but we cannot say that we much more admire the present apparently favourite method of graduated shading of the sky, in which a sort of rising veil of fog, starting from a streak of white in the horizon, effectually destroys every trace of aerial perspective the print might otherwise possess.

For general work, and with our ordinary apparatus, we may assume that if clouds are to be introduced they must be taken on separate plates, the effects desired being secured by some system of double printing; and we have no doubt that it is in this apparently troublesome operation the difficulty is supposed to lie. We hope, however, to show that first-rate results may be produced with no more difficulty or trouble than may be easily overcome by even a very inexperienced printer. The fact would seem to be that, whenever the method of introducing clouds by "double printing" has been recommended, the minds of most of our readers have reverted to the difficulties so successfully overcome by Rejlander and Robinson in the production of their composition pictures—difficulties sufficiently grave to discourage all but the most persevering from attempting to overcome them—forgetting altogether that the two things are totally different, as would be quite obvious on a single trial. In the production of composition pictures considerable artistic knowledge is absolutely essential for good work, and much patience and perseverance is required in so securing the exact registering of the various negatives in use as to prevent, as far as possible, the lines of junction being seen; but in the case of cloud printing all that is required is sufficient judgment to select such an arrangement as will harmonise with the lighting of the landscape, lines of junction being altogether quite safely left out of the question.

Of course the first requisite is the possession of some good cloud negatives, and the production of these is, perhaps, the only real difficulty in the case—a difficulty, however, principally felt by those whose lot has been cast in large cities, an open horizon being generally necessary for the best results. But even to the dwellers in cities the matter is not difficult, as, if they are landscape workers, they possess the privilege of visiting the country at more or less frequent intervals of time, and they should on such occasions never miss an opportunity of securing negatives of suitable clouds when they present themselves. What is required are masses, more or less large, of dark clouds with brilliant light issuing from out the intervals of cloud from the hidden sun. There need be no fear of too great contrasts in prints from such negatives, as when they are delicately printed even the most violent contrasts give very fine, soft effects. The kind of clouds suitable for our purpose are most frequently seen near the seaside, and pretty late in the afternoon; they are then sufficiently low to enable us to photograph them without much tilting of the camera—a thing to be avoided whenever possible, as the effect produced by clouds taken with the camera pointed upwards is hardly ever good. With wet collodion such a combination may be photographed, even with a tolerably small stop, in a fraction of a second, and with any of the ordinary dry plates in from one to five seconds. Some extra care is demanded in the development—softness in outline, transparency in the shadows, and perfect freedom from spots or markings of any kind being indispensable.

A suitable negative having been obtained, the first step in the operation of printing is to place the landscape negative against a pane of glass in the window of the room, or in any other position in which light will pass through it. On this is laid a sheet of white paper, transparent enough to let the detail of the negative be easily seen through it, and then with a pencil a line is roughly drawn along the outline of the sky. This outlined paper is then pasted on a piece of thick brown paper, a little larger than the printing-frame to be used, and, when quite dry, is to be cut along the pencil mark. By this means there will have been produced two masks—one for the sky and one for the landscape—very rough, it is true, but thoroughly suitable.

Having thus prepared the apparatus the printing is conducted as follows:—The landscape negative is placed in the frame, and the mask corresponding to the sky is laid on the outside, and in such a position as to cover a little more than the sky. Between the glass of the frame and the edge of the mask it is an advantage to insert a little cotton-wool (the pink kind used by jewellers answers best), which keeps the mask at a suitable distance from the glass, and gives the necessary softness to the print. We sometimes fasten the mask to the frame by paste, but it is better to fasten it by pins, as on examination, as soon as the image becomes visible, its position may be altered if necessary; but, generally, the pushing in or out of the cotton-wool will do all that is required. Of course it will be evident that this masking of the sky will only be required in cases where it is too thin or otherwise faulty; in our own practice we resort to it rarely, as our skies are generally sufficiently dense to print either white or to a tint slight enough to be unobjectionable. When the landscape is sufficiently printed it is removed to another frame containing the sky negative, and on which is placed the mask covering the portion printed, arranged exactly as in the case of the sky. This is then exposed to the light until the clouds are sufficiently impressed, which is, perhaps, the only part of the operation requiring some little experience, as it must be stopped just at the proper stage to give the soft, delicate effect upon which success so much depends.

Supposing a suitable cloud negative to have been selected, and the printing just carried to the proper depth, it will be found in the case of some pictures that the effect is a little "pronounced," and that there is an indication of harshness in the finished print. This is, however, easily remedied by putting the print into an empty printing-frame, covering the glass with a piece of cardboard, and taking it into the light—sunlight, if possible. The cardboard is then slowly drawn down to the junction of the landscape and sky, and as slowly pushed up again. This is repeated several times for a few seconds, by which means the lights and shadows of the sky will be so blended as to produce the necessary harmonious effect, and the work will now be quite satisfactory, no line of junction being visible, and the whole, to at least nine people out of ten, having the appearance of a picture taken at one operation.

We do not, of course, mean to recommend this procedure as giving absolutely perfect results, or results which will satisfy the most fastidious art critic; but we are certain that, until something better be devised, if those of our landscape artists whose pictures are printed without clouds adopt some such method as is here given their pictures would, to the general public at least, possess a charm to which they have at present no claim, and meet with an appreciation which they as yet lack.

It may possibly be too much to expect of all our professional photographers that they will find it convenient to give so much additional time to pictures which, in some cases, require to be printed in very large numbers; but we are sure that amateurs will find the work both pleasant and profitable—that is, in the sense of its eliciting a greater amount of admiration; and, as the amateur has generally been but the forerunner of the professional photographer, his lead in this direction is certain to be largely followed.

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We learn with regret of the death of Mr. C. Breese (formerly of Birmingham), which event occurred at Matlock on Monday last, the 17th inst. By the instantaneous "moonlight" views which Mr. Breese brought before the notice of the world in 1861, he gave a great impetus to the production both of views and scenes of this kind, and of stereoscopic transparencies; for, as most of our readers are aware, this was the form in which the artistic works of the deceased gentleman were presented to the public. Soon after Mr.

Breese's advent upon the public photographic stage a great amount of discussion took place, and a good deal of misapprehension existed, relative to the method of process by which his pictures were produced. The popular idea was that the so-called "moonlight scenes" were really what they purported to be, namely, views taken by means of moonlight, through the agency of a process of extraordinary sensitiveness discovered by the artist. That Mr. Breese himself encouraged this idea there is no doubt; for we read in a contemporary, whose editor had an interview with the deceased artist at the period of the publication of the moonlight views, the following remarks:—"That these effects of moonlight, real and illusive as they seemed, were produced in some way by the aid of sunlight we felt little inclined to doubt, until on subsequently meeting Mr. Breese, and spending some pleasant hours in his company, he gave us his assurance that each view was really what it purported to be, without any trick—that the moonlight pictures were *produced by moonlight only*, and that they had required little more than instantaneous exposures." It is now well known that these alleged instantaneous moonlight views were taken by *sun*light, the moon itself having been printed in the picture, or (in some cases) printed upon a second plate of glass used as a backing for the instantaneous view from a separate negative of the moon, which latter negative, we can readily believe, was really instantaneous or nearly so. That some isolated pictures in Mr. Breese's large collection may have been produced by a *very long* exposure to the light of the moon we doubt not. We have examined a picture of a white statue which was said to have been so produced; but it bears no comparison whatever, as respects beauty or effect, with the instantaneous views which led to so much controversy at the time of their publication. It is to be regretted that Mr. Breese should have allowed misconception to exist relative to the method of their production. Mr. Breese was a man of a retiring disposition, and the conclusion at which we arrived, after an interview with him on the occasion of our attending the Birmingham meeting of the British Association, was that he was one of the last men in the world who would wish to be dragged into public notice. The great taste and singular ingenuity displayed by him in his wonderful stereoscopic transparencies warrant us in saying that Mr. Breese has exercised an important influence upon photography—an influence which is felt even at the present moment.

## DR. VOGEL'S THEORY.

The readers of this Journal will doubtless remember that a discussion took place about a year ago in its columns on the subject of a theory published by Dr. Hermann Vogel. From this theory I felt compelled to dissent, and I soon found that I had upon my side several distinguished English scientists. Dr. Vogel replied, and called in question the experiments I had advanced.

During the past winter, whilst engaged in studying the influence of the less refrangible rays upon silver iodide and silver bromide, I took occasion to examine a second time the points as to which Dr. Vogel and I differ, and the result was fully to confirm the opinions which I had previously expressed. I think these recent experiments will afford a convincing proof that Dr. Vogel's theory is untenable.

Dr. Vogel's theory may be stated as follows:—If we desire to render silver bromide sensitive to any particular colour, or to increase its sensitiveness to any particular colour, we have only to place it in contact with a substance possessing two properties—first, that of absorbing bromide; second, that of absorbing the ray to which we wish to render the silver bromide more sensitive.*

The conclusion to which I came, after a long series of experiments, was that no such relation existed. That bodies both white and coloured sometimes exercised a well-marked influence in heightening the sensitiveness of silver bromide to particular rays, but that no relation could be traced as connecting the colour of the influencing body with that of the ray to which the sensitiveness was increased. And I especially pointed out that some of the substances which exhibited the most marked effects upon silver bromide *were either quite colourless or had only a faint neutral shade.*

* Dr. Vogel's own words are:—"Wir sind im Stande Bromsilber für jede beliebige Farbe lichtempfindlich zu machen, respect erlich die bereits vorhandene Empfindlichkeit für gewisse Farbe zu steigern; es ist nur nöthig einen die chemische Zersetzbarkeit des Bromsilbers befördernden Stoffe zuzusetzen, welcher die betreffenden Farbe absorbirt, die andern nicht."—*Ber. Deutch Chem Ges.* 1873, p. 1305.

It seems somewhat remarkable that the number of substances which Dr. Vogel has named as supporting, in his opinion, his theory should be so very limited. The number of substances which are capable of "absorbing" (or rather combining with) bromine is very large, and very many of these substances exhibit well-marked coloration. In fact, nearly the whole series of aniline colours fall under this category. Dr. Vogel has, however, instanced but three, and I shall, I think, be able to show that two at least of the three do not in the least support the theory. As to the third substance, whilst I do not offer any opinion, I have no reason to think that it does better than the others.

Of the three substances cited by Dr. Vogel that with which he has principally worked, and on which he principally has relied, is *coralline.* I have during the past winter examined the relation of coralline to the sensitiveness of silver bromide as exhibited to the less refrangible rays, with results altogether unfavourable to Dr. Vogel's theory. Coralline transmits strong red light, and, consequently, the sum of its absorption spectrum must be green. When solutions of coralline are examined with the spectroscope—especially when they are somewhat dilute—it becomes immediately evident that the green rays are absorbed much more completely than the yellow. For this reason, and because the complementary colour of the transmitted spectrum of coralline is green, coralline ought, according to Dr. Vogel's theory, to specially increase the sensitiveness of Ag Br to *green* and not to yellow. Dr. Vogel does not, however, allege as the result of his experiments any increased sensitiveness to green, but only to yellow. My own experimental results were as follow:—

To the red rays—namely, those from the extreme visible end of the spectrum down to the rays whose wave-lengths are $\lambda$ 605—*coralline increases very materially* the sensitiveness of silver bromide.

To the yellow rays, whose wave-lengths vary only moderately from $\lambda$ 570, there is a moderate increase of sensitiveness.

To the green rays, taking principally those whose wave-lengths lie between $\lambda$ 517 and $\lambda$ 569, *coralline gives no increase of sensitiveness whatever.*

Thus it appears that the effect of coralline is to increase the sensitiveness of silver bromide to the *rays which it transmits, not to the rays which it absorbs.* So far from supporting Dr. Vogel's theory, it is subversive to it, and, on the contrary, it confirms my own opinion above expressed.

With naphthaline red—another of the three substances cited by Dr. Vogel—I have not experimented; but, as it is a red, not a dark orange, substance, it transmits red rays, and the sum of its absorption spectrum must be green. It ought, therefore, to prove the theory in question—heighten sensitiveness to green rays; but this is not alleged by Dr. Vogel, but only a heightening to yellow.

In a second paper* published by Dr. Vogel subsequently to the appearance of mine of March, 1874, he comes to the same conclusion as that which I had already published as to the power of colourless substances to modify the sensitiveness of silver bromide to particular coloured rays. "*Colourless bodies also,*" he says, "other than silver nitrate—for example, morphia—change the sensitiveness of Ag Br and Ag I to the colours of the spectrum in a marked manner."† This was my own conclusion, and as it was published some time before Dr. Vogel's paper appeared an acknowledgment of priority might well have accompanied it. Moreover, Dr. Vogel does not seem to have perceived how strongly this admitted fact of colourless bodies modifying the sensitiveness of Ag Br to coloured rays militates against his own theory; for that theory would make this power to be essentially connected with the colour of the influencing body, and one of its special functions; *so that a colourless body should* (if it influenced the sensitiveness at all) *influence it equally to all colours.* This, it will be perceived, is a fair and logical deduction; and as it has been proved by me, and admitted by Dr. Vogel, that the result is quite different, there arises an additional very strong argument against the theory. So far, then, the mass of evidence, as deduced from experiment, tells most strongly against Dr. Vogel's theory.

M. Carey Lea.

* *Ber. Deut. Chem. Ges.*, 1874, p. 545.

† *Ibid.*, 550.

## ON THE COMPARATIVE SENSITIVENESS OF VARIOUS PHOTOGRAPHIC PROCESSES.

[A communication to the London Photographic Society.]

I have for some considerable time past been testing, experimentally, the sensitiveness produced by various modifications of the photo-

graphic negative processes, both with the bath and with an emulsion. I have frequently noticed during the course of these experiments that my experience has been opposed to that of others who have recorded experiments in the same direction in the various photographic journals. Where the quality of the negative is in no degree sacrificed by increasing the sensitiveness of the materials composing the film I have always thought that the more sensitiveness we can impart to the film the more advantage and facility do we obtain in our work; and I think that the subject on which I am writing is of such great importance that it has induced me to bring the matter before the Photographic Society. We frequently find it recorded in the journals that such and such a process has given such and such results, but there has never been an attempt to produce those results by a standard measure of illumination; and we finally arrived at the *reductio ad absurdum* in connection with the subject when we were gravely told (though I do not think many people remained grave when they read it) that a transparency could be printed on a certain kind of dry plate by half-a-second's exposure to the light of a farthing rushlight!

Feeling then, as I do, the great gain to the photographic world at large that even a slight increase of sensitiveness gives to a negative process I venture to make the following suggestion to the President and Council of the Photographic Society. I think it would be a great advantage and assistance to the photographic public if the Council would appoint a small standing committee to investigate from time to time the sensitiveness of the various modifications of the photographic negative processes, wet and dry, that may be brought before them—to do which they would have to establish a standard method of illumination, and use certain standard negatives from which to print transparencies. In my own practice I use a standard argand gas-burner, at a certain distance from which a shelf is placed whereon the printing-frame containing the negative and plate on which to print the transparency is laid, and the time of exposure can be regulated to a great nicety. I have used in my experimental work during the last three years one standard negative, from which I must have printed some thousands of transparencies; and I need hardly say that the information I have in that manner acquired has been of great interest and value. In cases where it has been deemed desirable to take a negative I have endeavoured, by burning a certain amount of magnesium wire, to obtain a standard result; but I find that the printing of transparencies in the way just described gives results much more certain and reliable.

If this committee were to be appointed, and if good men were to be found who would undertake this somewhat troublesome duty, we should find that many preconceived opinions would be ruthlessly demolished; we should find that there is no inherent virtue in gelatine over collodion for making an emulsion with, and that a properly made collodion emulsion is every whit as sensitive (owing to the lattitude which may be allowed in exposure and development of a collodion dry plate, and which a gelatine plate is not, in reality, more capable of standing) as a gelatine emulsion; we should find that the addition of ten to fifteen grains of nitrate of uranium to the ordinary silver bath gives a considerable addition to the sensitiveness; we should find that, under certain circumstances of emulsion work, Mr. M. Carey Lea has been correct in pointing out the additional sensitiveness imparted to the emulsion by the use of an iodide therein; and we should find that the use of a chloride in the emulsion or in the collodion used with the bath is an element of insensitiveness, though the reverse attribute has been claimed for it by some writers who have followed in the footsteps of Mr. M. Carey Lea, who first proposed to introduce it into an emulsion for purposes other than to gain increased sensitiveness.

I could give you many other instances and many other results of my own work; but I feel that I should in that case be anticipating the labours of a committee that I much hope to see established; and I do not wish to prejudge cases that in all probability would be brought before them.

In conclusion: I express a hope that my proposal will be favourably received by the members of the Photographic Society, and that I shall be supported in bringing my suggestion before the President and Council. H. Stuart Wortley.

## NOTES FROM THE NORTH.

I wonder what our friend "D. W." means by his invitation to four of the occasional contributors to The British Journal of Photography—my humble self amongst the number—to tell him what we mean by the terms "discovery" and "invention." I had always thought that amongst ordinary mortals at least, there could be no difference of opinion as to what such simple and generally-used words implied. "D. W." evidently thinks—and probably he may be right—that we are a queer quartet. We certainly have now and then treaded slightly on each other's toes, but I am sure not one of us think less of each other for that. Some of us may even be troubled with corns, and consequently are inclined to be savage at the crushing moment; but I can speak for myself at least—and, I believe, for the others too—in saying that with the cessation of the pain every vestige of the irritation passed away. Although, however, we may have now and then differed on certain matters of opinion, I really do not suppose we have ever done so on questions of fact, and am quite certain we are all at one as to the true definition which should be given of the words about the interpretation of which "D. W." seems somewhat anxious.

Probably, however, "D. W." simply wants to know what we understand the words to mean in their application to photography, as, perhaps, he may be one of those who seems to hold very peculiar notions of many things appertaining to that wonderful art. In everything else "discovery" is held to mean that the discoverer has acquired a knowledge of something that he did not before know; and "invention" implies that the inventor has devised or constructed something that had not previously been known. I would even go a little farther, and say that the inventor or discoverer was truly entitled to the honours, although his invention or discovery had been previously known to others, if he could show that they were new to him. But in photography it is altogether a different affair, or is, at least, considered so by some people. Here we really have two classes of discoverers—one of which labours hard in practical experiment and gladly publishes in the journals devoted to the art all that it finds out; the other, whenever it comes across what it considers a good thing, and sometimes even when the thing may not be very good, quietly appropriates it from those pages, and unblushingly sells it as a "discovery" to all who are foolish enough to purchase.

If "D. W." will take the trouble to look back to some of my former notes he will find therein recorded two excellent examples of the kind of discoverers to which I refer. The one had got hold of an old and tolerably well-known method of enlarging—*discovered* it, in fact, in some of the back numbers of the journals—and managed by his "discovery" to extract a good many pounds from the pockets of unsuspecting photographers. The other, with much greater boldness, did not look far for his "discovery," but found it in the current numbers of the journals and in everybody's mouth, and although it was then, and is still, a *questio vexata,* he put it up in sealed packets and tried to drive a roaring trade at two guineas apiece. Now to the former class all due credit and honour should, I think, be given; but I am sure "D. W." will agree with me when I say that the actions of the latter are worthy only of condemnation.

I hope "D. W." is now pleased; but we are in this part of the world rather ticklish about our confession of faith, and I hope he will not ask any more questions.

Photographers generally are now "haymaking," and have little leisure for experiment, or inclination to spend their time in furnishing me with wrinkles or dodges for these *Notes.* Retouching, however, I am sorry to say, while falling into disuse in the best studios in the city, is finding its way into the provinces, as I learned from Mr. Mackintosh, of Kelso, with whom I spent some pleasant hours a few days ago. He told me that there was a growing demand for that kind of thing; and, as his object was simply to please his customers, he had sent his daughter to London to learn the art, determined in that, as in all other things, to do well what was worth doing at all.

I often wish I could get the ear of the general public, outside the circle photographic, that I might descant on the pleasures of amateur landscape photography. Whoever could do that, and do it well, would certainly attract hundreds of additional recruits into our ranks. While at Kelso I, along with a friend, resolved to visit Yetholm, the capital of the gipsies. We drove to the place—a distance of some six or eight miles of glorious country—on a fine evening, and were most hospitably entertained by Miss McCallum, of the Plough Inn. The following morning was all that a photographer could desire. Grand sunlight without a breath of wind, and fine white clouds, which just sufficiently tempered the hot rays and gave an occasional refreshing shade. Yetholm—or, rather, Kirk Yetholm, as there are two villages, and it is the latter which has the honour of possessing the royal palace—is an irregular, very irregular, collection of quaint thatched cottages, some few of which stand end to end, making something like a street, but the rest are scattered about in all directions, without the least regard to orientation, every man seeming to have built after the pleasure of his own uncon-

trolled and objectless will. The gipsies are evidently not a growing race, or at least the capital is not in an improving state. It does not contain a single cottage that is not in the "sere and yellow leaf," and it contains a great many that have long since passed that venerable state—that are, in fact, merely the wrecks of former days. The fact would seem to be that as soon as a house becomes, from want of repair, uninhabitable—and for a gipsy it must be very bad before it reaches that point—it is vacated, and allowed to tumble into picturesque ruin. Here, of course, there was no lack of "food for the camera" of a certain kind; but we, as in duty bound, proceeded first to the palace. This is a more ambitious structure than any of the other houses, standing in the middle of a lawn of about thirty-six feet square, and having a wall in front, an iron gate, and tiles on the roof. It consists of a single room lighted by one window in front and another at the end, the one in front being nearly hidden by ivy, which climbs far up over the tiles. At this imposing structure the camera was pointed, but success was likely to be marred by the gentle but incessant motion of a flannel garment which had been hung to dry on the neatly-painted iron railings. I mustered, however, sufficient courage to knock at the palace door, and on being honoured by the appearance of the Princess Royal, humbly prayed for the removal of the obnoxious garment—a request which was most graciously complied with by the aid of her own royal hands.

The exposure was then commenced, and as my plates were "slow-but-sure" beer and albumen, I had plenty of time to look about me for the next fifteen minutes. By and by the door of the cottage opened and Her Majesty Queen Esther appeared. Knowing something of photography, as she seems to do of most other things, Her Majesty came rapidly along, and at once introduced herself, gave us a hearty welcome, and, on learning that a long exposure was to be made, invited us into the royal house. This invitation we gladly accepted, and were formally introduced to the Prince (who was at tea, although it was near midday) and two Princesses (who were smoking). We were pressed to take tea, but the weather was too warm for that, and we, in return, pressed them to join us in some beer which we had. This, however, except merely touching our tumblers with their lips, was declined on the ground, as expressed by Her Majesty, that "the glass has brought my race to grief. I never touch it, and am better without it. I am eighty-four years of age, and yet I can with comfort 'drive my own pair' thirty or forty miles a day, which is more than many beer or whisky drinkers can do at half my age." Still she graciously offered to join us in a pipe; indeed they all seemed much to enjoy smoking.

To make sure of getting a good picture I exposed a second plate, and while it was going on we were shown the "state papers," consisting of letters from nearly all the "titled" people of the country, and also the crown jewels, which latter included rings of considerable value presented to the Queen by earls, countesses, lords, &c. We were also shown the crown itself, which is kept under glass, and seems to be made up of glass and tinsel, but of tolerably elegant design.

On the whole, we were much pleased with our visit to Queen Esther, and could not avoid thinking that if her subjects had only been like herself the race would have been in more general favour.

After leaving the palace we secured some very fine specimens of gipsy architecture, and wound up with a good picture of our hotel, with several hundreds of sheep in the foreground; and, although the exposure lasted for ten minutes, they are wonderfully sharp, as they were lying quite exhausted by the intense heat. I may say that from every plate exposed an excellent picture has been developed.

In the reception-room of one of our principal photographers I saw, a few days ago, an exceedingly-beautiful miniature, or rather a *carte de visite*, painted. There could be no doubt that it was the work of a master hand; but, in addition to that, there was a certain indescribable charm about it that I can hardly express. It was like ivory, but much better, as it possessed a richness, softness, and depth that I never saw on ivory. On inquiry I learned that it was the result of some recent experiments of the proprietor, who was himself the artist. An ordinary *carte de visite* is somewhat underprinted, and then coated with a solution of white wax and dissolved ether, and on this surface the paint is laid. Possibly it is not new—nothing is ever so now—but it is new to me, and certainly I never saw an effect which I so much admired. The permanence of such a picture is probably a different question, although, if hermetically sealed and carefully kept, it would, at least, be a "thing of beauty" for a very long time.

I wanted to have a word or two with our "Peripatetic" friend and some others about *our* beer and albumen—a subject on which I am somewhat touchy—but must reserve that for my next.

John Nicol, Ph.D.

## ERRORS IN ACTINOMETERS.

In a communication from Professor Stebbing, your Paris correspondent, I see that M. Leon Vidal has brought before the notice of the profession a new actinometer; therefore I am of the opinion that this is not an ill-chosen time to call attention to a circumstance probably well known to most photographers, and which, to a great extent, render all such instruments valueless for experiments where scientific accuracy is required. Let it not be supposed that I point to the instrument before mentioned as containing such liability to error any more than others of its class. What I desire to say is that there are circumstances to which all are subject, and which render them untrustworthy guides. It has long been the custom to separate a ray of light into three components, viz., heat, light, and actinism. To the first one thermometers are sensible, to the second our eyes, and to the third a numerous class of bodies which under its influence undergo some change to which we are sensible.

It is to circumstances in connection with this last property that I would draw attention. If a ray from the sun be analysed by prismatic analysis, and the solar spectrum thus formed received on a film of iodide of silver, such film will be changed and an action have taken place which can be shown to extend beyond the visible spectrum, and to end in the visible portion occupied by the blue rays. Now, if bromide of silver be substituted for the iodide this action is shown to extend beyond the blue rays and into the green. Probably it would not be difficult to find a substance sensible to the whole spectrum; this, however, is apart from my subject. It is sufficient to say that, inasmuch as one is sensible to rays to which another is insensible, it follows that such substances would not be satisfactory tests to each other if used as standards whereby their relative sensibility to total daylight was ascertained.

A little reflection will show that, in the case of the iodide and bromide of silver, a condition of things could be produced in which the one would be acted upon and the other remain insensible. In ordinary practice there is no evidence to show how near these circumstances are approached.

It is useless to name, or rather fix, any amount representing such divergence in sensibility, for the uncertain quality of light is always the unknown quantity. In all the materials used as sensitive agents by photographers a few experiments with the solar spectrum will convince one of their dissimilar sensitiveness.

The ordinary actinometer is delicate enough for all general purposes, and it is useless to seek after greater sensibility unless the before-mentioned conditions are taken into account. In the case of carbon printing I have done this by working in monochromatic light, in which both the actinometer used and the tissue were sensible. Such refinement was only done for a specific purpose, and upon which I may have something to say at a future time.

W. E. Batho.

## ON THE USE OF PHOTOGRAPHIC AND CHEMICAL APPARATUS.

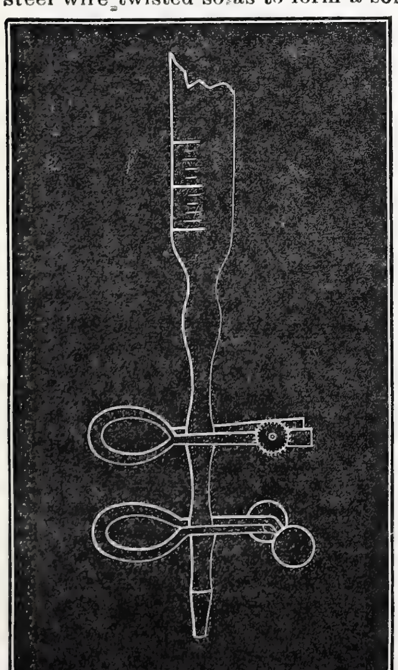
CHAP. XI.—ON MISCELLANEOUS APPARATUS.—(Continued from page 198).

India-Rubber Tube.—This is made in two distinct varieties, the vulcanised and the pure, the former being the more generally convenient and the more readily obtainable. The pure caoutchouc tube will be found most useful in joining small and delicate pieces of apparatus, as it is obtainable thinner than the other kind, and, when warm, is more flexible; it is thus more easily secured to thin gas tube, &c., by tying. The vulcanised tube can be purchased of almost any diameter and of several qualities, the kind usually kept by the dealers being lined with wire inside. This is not of very good quality, but will answer for general use. It is not, however, suited for conveying gas for burning—as to a Bunsen burner, for instance—though it is generally supplied for that purpose, the gas having some peculiar disintegrating action upon the tube, soon rendering it permeable by the gas, which then vitiates the atmosphere of the room by its continuous escape in small quantities. For leading gas for this purpose a special glazed tube is made, or some of the thickest vulcanised tube may be used if the glazed should be considered too stiff and deficient in pliability. The use of sheet india-rubber for extemporised tubes has been treated of; the same material will be found very useful for a variety of purposes, such as covering the mouths of bottles, making valves, &c. A still further use for caoutchouc will be noted, viz., for preventing glass stoppers getting fast in the necks of bottles, as with some liquids they are very prone to do. For this object it requires to be burnt till it becomes of a thin pasty consistency; it may then be smeared over the stopper, and will remain soft for years, however seldom the bottle may be used.

*Dialysis.*—This very important process is used for the purpose of separating salts and substances analogous to them from solutions containing also material of a gelatinous nature. The latter class of bodies the discoverer of the process—the late Master of the Mint—called "colloids," and the former "crystalloids." In the crystalloid class are included all crystals, such as salt, sugar, &c., and other substances, solid and liquid—as, for instance, alcohol—which are closely related to them. Colloids include albumen, gelatine, starch, gum, &c. Crystalloids will readily permeate such substances as animal membrane, starch, paste, &c., which offer a complete resistance to the passage of colloids. If, therefore, a solution containing both classes of substances be brought into immediate contiguity with a mass of water, separated from it only by a piece of bladder or parchment paper, the crystalloids will leave the mixture and become diffused through the water, but the colloid will remain behind.

An apparatus for performing this operation is called a "dialyser," and consists of a short, hollow cylinder or hoop, to the mouth of which a piece of membrane—or, what is easier to obtain, parchment paper—is stretched. It is conveniently made of gutta-percha in the shape of a hoop, and the "septum," as the separating membrane is termed, attached to it by sliding a second hoop over. The paper should be soaked for a minute or two in distilled water before straining it upon the apparatus, and should be pulled so as to be quite even and smooth. The liquid to be operated upon is gently poured to the depth of about half-an-inch into the dialyser, which is floated on the top of the trough containing distilled water, and allowed to remain undisturbed for twenty-four hours. It will readily be perceived that any utensil can be applied for the purpose which allows of the mixture being brought into the requisite contact with the water, the chief precautions to be taken being that the liquid to be operated upon should be not more than about half-an-inch deep in the dialyser, and that its level should be about the same as the water in which it is immersed. A common earthenware jar with a hole knocked in its bottom and a septum tied round its mouth is as efficacious as anything. It would require to be suspended over the jar at the requisite height by a string attached to a piece of stick or a glass rod placed across. Before beginning the operation it should be ascertained that the septum is free from any minute holes or punctures. This can be done by placing the dialyser upon a sheet of white blotting-paper and pouring a little distilled water into it. The presence of a hole would be shown by the water passing through and wetting the paper, thus forming an easily-seen spot. Any hole discovered could be remedied by attaching a small piece of the parchment paper by the aid of thick shellac solution or a little white of egg; the latter would require to be coagulated before it dried by the application of a hot iron.

*Pinchcocks.*—The mention of caoutchouc tubes would be incomplete without a description of the pinchcock. This is a piece of steel wire twisted so as to form a sort of spring clip, readily opened or closed with the thumb and finger. It is slipped over the tube to a suitable position, and is then used for arresting or permitting a liquid to flow through. They are made of various sizes and strengths, according to the thickness of the tube they are required for. A second form is made with a screw, and is more especially used for regulating the rapidity of flow. It is frequently adapted to a burette, so as to allow the liquid to pass through in drops only. There is then fixed to the same tube, but higher up, one of the ordinary pinchcocks for opening up or closing the supply. Both forms are here shown attached to a burette. The spring cock is a most useful little apparatus in the dark tent for attaching to the india-rubber tube from the water supply. It explains itself as soon as seen, one little hint only being necessary—the tube should be placed as near the spring as possible; if it work itself too near the finger plates the pressure is often not strong enough to clip the tube with sufficient force to prevent escape.



G. Watmough Webster, F.C.S.

## FOREIGN NOTES AND NEWS.

German Photographic and Archæological Expedition to Chaldea.—M. Geymet's Method of Fixing the Images Produced by the "Dusting-on" Process.—New Preservative for Dry Plates.—Chloral Hydrate as a Means of Preserving Albumen Solutions.—M. Leon Vidal's Heliochromic Process.—Kardaetz's Letter from Chefoo.—The Eclipse of the Sun at Camorta.—Duty Levied on Photographic Materials Entering Austria.—New Preparation of Gelatine for the Lichtdruck Process.

We understand that two German members of the expedition to Asia for the observation of the transit of Venus, viz., Dr. Andreas, of Kiel, and Dr. Stolze, photographer, of Berlin, have not yet returned to Europe. The Prussian Minister of Art and the Berlin Academy of Science, having determined to bear the cost of a scientific expedition to the cradle of human culture—Chaldea and the regions about the Euphrates—took advantage of the presence of these gentlemen in Asia, and arranged that they should meet at Ispahan when their astronomical labours were finished, and from thence start for the scene of their archæological explorations. The present arrangement is that they shall spend nine months in examining interesting archæological remains, taking casts and tracings of inscriptions, and photographing architectural ruins and sculptures. We hope that they will bring back with them to Europe a rich harvest of materials for illustrating the early history of the world, and elucidating some of the more obscure passages of the Old Testament narratives.

At the last meeting of the *Société Française de Photographie* M. Geymet, in the course of his remarks on the subject of vitro-enamels and the reproduction of negatives by what has been termed here the "dusting-on" process, made mention of a method of removing the yellow tint given to the negatives in the latter process by the bichromate contained in the sensitive film. It consists in dipping the developed plate for some minutes into a mixture composed of alcohol twenty-five parts; water, saturated with borax or alum, five parts. The alcohol dissolves out the chromic acid, the borax or alum immediately rendering the film of gum insoluble and preventing the destruction of the image. Water alone would remove the objectionable colour, but would, at the same time, dissolve the image.

The same gentleman gives in the *Journal de Photographie* an exposition of the alkaline development as applied to dry plates. The first point which strikes us is the preservative which he uses, and which bears a resemblance to the albumen preservative recently spoken of by Mr. M. Carey Lea. It consists of—

| | |
|---|---|
| Tannin ........................................ | 3 grammes. |
| Acetic acid .................................. | 5 cubic cents. |
| Beer ............................................ | 50 „ |
| Water ......................................... | 50 „ |

The acetic acid is first poured upon the tannin, and, when dissolved, the beer and water are added, the mixture being well shaken. The white of one egg is then added, and after vigorous agitation the mixture is filtered through paper. These directions are just the reverse of those given by Mr. Lea, the latter insisting upon the addition of the tannin last of all the ingredients. After giving his formulæ for the alkaline development, which do not differ materially from those in use in this country, M. Geymet adds:—"This solution will not in any way strengthen the negative; its object is complete when the image is visible." He then proceeds to describe the method of intensification by the ordinary acid silver process. Surely our French neighbours are behind the time in their knowledge of this mode of development!

In the *Photographische Archiv* Herr Gustave Re recommends, for the purpose of keeping a solution of albumen fresh for a length of time, the addition of five per cent., *by weight*, of chloral hydrate. We presume that five per cent. on the weight of albumen *supposed* to be contained in the solution is intended, otherwise the addition will be found not only expensive but will materially alter the nature of the solution. Possibly the use of *dried* albumen may be more extensive on the continent than in this country.

In the *Journal de Photographie*, appended to a reprint of M. Leon Vidal's recent paper on heliochromy, appears the following editorial note:—"We always notice that M. Vidal's language is so obscure that it is impossible to give any account of his manipulations until such time as he shall consider it convenient to fully divulge them. The present announcement is the oft-repeated one of a process proved by its results; but that is neither a description nor a publication of the process."

A long letter from Herr Kardaetz (a member of the German expedition for observing the transit of Venus) to Dr. Vogel was read to the Berlin Photographic Society, and was thereafter published in the organ of that Society, the *Photographische Mittheilungen*, to the great annoyance of several of the members, who protested that the letter contained no new astronomical facts—that it gave too many details of the writer's journey, and thus tended to lower the prestige of the Society before whom it was read. In this case we think their alarm was groundless, and we should be very much pleased if these gentlemen never offered us through their organ any less novel or original article. The peccant letter is written at Chefoo, and the writer announces his intention of returning to Europe by way of Japan and San Francisco, and making a collection of photographs to illustrate his tour round the world. The passage in which he relates how he and four other members of the expedition went down to Greenwich Observatory to get their chronometers regulated is rather amusing:—Each man laden with his chronometer took the train from London to Greenwich, and eventually arrived, gasping, at the gate, and, after a somewhat lengthy parley with the porter, they found themselves the victims of red-tapeism, and had to retrace their steps without being allowed to obtain the small concession for which they had put themselves to so much trouble.

While on the subject of astronomical expeditions we may mention that at Camorta the sun was hidden by a cloud ten minutes before the total eclipse began, and did not emerge until all was over. Camorta is the station to which Dr. Vogel was to have gone; but we learn that he did not intend to push on so far, so there is still hope that he has succeeded in getting spectroscopic photographs, especially as the obscuration at Camorta was quite local, the eclipse being well seen at a village four miles distant.

At the April meeting of the Vienna Photographic Society there was little business of general interest transacted, as all the committees are busy preparing for the forthcoming exhibition.

Dr. Hornig called attention to the very small number of foreign exhibitors who had as yet sent in their names. Switzerland has two, Denmark three, Sweden and Norway two, France two, Russia one, Portugal one, and Great Britain only one representative.

The attention of the meeting was directed to the anomalous circumstance that while mounted photographs can be imported duty free into Austria all the materials required for their production—mounts, chemicals, albumenised paper, &c.—are liable to a higher or lower duty. It seems especially strange that finished pictures should get off scot free while the negatives from which they are printed pay duty as fine glass. The customs officials assume the right to unpack these delicate and often valuable plates, and by this means sometimes damage them. Perhaps it would have been as well, however, for Dr. Hornig to have borne in mind the proverb "let sleeping dogs lie," lest, having their attention called to the matter, the customs authorities do away with the anomaly by placing a duty upon finished photographs also, and not by remitting that on glass, chemicals, &c., free trade doctrines not yet being adopted by the Austrian government.

Dr. Hornig further showed a sample of gelatine specially prepared by Herr Seitz for the lichtdruck process, and said that Herr Seitz would provide any of the members with a specimen provided it was only used for lichtdruck experiments, as he is very anxious to hear the opinion of competent critics on his preparation. However anxious Herr Seitz may be as to the decision they may come to as to the working qualities of his gelatine, he has given no clue to the difference between his preparation and ordinary gelatine.

## OUR CLUB.

### No. V.—Tom Cooke on Burnishing.

You remember little Tom Cooke who had to stand upon a little stool before he could see to focus a sitter, he was so small. Some of them used to sneer and talk about "Jack-in-the-box;" but our little Jack could have put a few of them in the box when it came to be a question of general information and knowledge of everyday work. So he was considered an authority amongst us. The night on which he was to give us a few words on burnishing was a full night at the Club. He was so small that his head just appeared over the ledging of the desk at which he was to speak; but, coming to the one side, he took up his position so that *all of us* could see *all of him.*

He began:—"Gentlemen, you doubtless came tonight to hear my views on the various patents in use just now for the polishing of pictures. Doubtless many of you came to know which of them I work and how I get on with it; but I came not to talk to you of a machine at all. My announcement was but a catch line to draw you together; in fact, I'm in the position of the man who advertised his book *Rain for Mown Grass*, the first edition of which was rushed after by all the farmers in the district, who, when they found that it was a series of sermons, felt sold, and many of them wrote to the author remonstrating with him for using such catchpenny advertisements for such a holy purpose, misleading people. Tonight my subject is not how to burnish your prints, but rather how to burnish yourselves, your places, and your show-cases, so that you may be in a position to do a larger and a better trade with satisfaction to yourselves and to your clients. And now if, after this explanation, any of you feel annoyed at the title of my paper you do not need to mention it, for I am quite pleased that my burnisher announcement should have produced such a *rolling press.*

"Now, gentlemen, artists—by which I mean painters—are well known to be an eccentric caste. Many of them, in fact, are as well known by the pictures they make of themselves as the pictures they make, even to the length and parting of the hair and the peculiar way in which they dress, proclaim to the world the profession. Now, some of you affect this sort of thing, and it should be avoided; for, photography being as much a trade as a profession, it is only good, steady work, and not your 'get up,' that will show a good return.

"Nor would I have you to become slovens and regardless of cleanliness. I once knew an artist who took up this line of business, so to speak. He was a man of genius who could make any amount of money, and still he preferred to go about threadbare, seedy, and unshaven, delighting in being mistaken for a cobbler or a herd. John Munro was his name, and he was an animal painter of some importance in his time. With great glee he used to relate incidents of mistakes that arose from his personal appearance. I will just tell you one which he used to enjoy relating:—

"A nobleman had written for him to come to his place to paint the pictures of some prize cattle previous to their being sent to the fair. John arrived in the village close to the estate, and, after dinner, as he was preparing to go up to the mansion-house, he happened to look into the mirror and observed that his face was very grey and dirty. He had not been shaven for a week, and, as he drew his fingers through the grey stubble that was growing all over his chin, producing a sound as pleasant as that of a file on a saw, he reflected and said—'Well, I'd better have a shave.'

"Calling the waiter he said—'Any barber in the village?'

"'No, sir,' the waiter replied; 'but there's a shoemaker down the street who usually shaves anybody that wants shaving.'

"John went away down to the leather-fisted handler of the razor, and, having been supplied with a three-legged stool, sat down, had a print cloth put in front of him and tucked in round his neck, and the following conversation in the easy familiarity of style of the country took place:—

"'You're a stranger here, sir,' said the shoemaker with a grin, as he applied the soap to John's mouth and chin.

"'Yes!' issued out of an opening in the white soap, which immediately closed again. He was afraid of getting a mouthful of brush.

"'Are you working, or are you seeking work?' continued the shoemaker.

"Oh! I've got a job,' John replied.

"'What will your trade be?' asked the shoemaker, evidently bent on finding out all about his customer.

"'I'm a painter by trade,' John said, with a smile.

"'A painter! And whar have you got a job here? I ken naebody that wants ony work.'

"'I'm gaein up to the big hoose.'

"'The big hoose!' exclaimed the shoemaker in astonishment. 'You mun be wrong. They had a man painting the cart-wheels and ploughs and harrows and things there last week! What are you gaein to due?"

"'I'm gaein to paint the cattle.'

"'Paint the cattle, sir!' exclaimed the shoemaker, dropping the money he had received for his work in his astonishment. 'Paint the cattle, sir!' he repeated. 'D—n it! are they no a guid enough colour already?'

"The shoemaker had a good laugh when the thing was explained to him, and the artist and the barber parted.

"In the case of John Munro it is called 'eccentricity;' but in ours, believe me, it would not be called by such a polished name.

"I wish to draw your attention to two classes of operators in our midst which, I think, might be much improved. The first of these I will term the 'spotted operator,' and the latter the 'glazed operator.'

"The 'spotted operator' moves about eternally marking his clothes, as if he were afraid they might be stolen. His coat, his trousers, his vest, his shirt are all covered with silver spots, and his hands are ever streaked and marked as if donning the war-paint of the Indian. That a spot now and then is unavoidable we all know; but really many of you indulge to excess. To such I would say—'Be a little more careful and you will save both your appearance and your silver.' To you who are not addicted to this bad habit I would say—'Show the others how—not to do it, and if they can be advised to take your instructions and act on them they are sure to become more burnished and bright.'

"The 'glazed operator' is of a different stamp, but certainly quite as objectionable. He is just like an animated slide, and *slips* through the world. A soiled collar and a soiled front are all that go to relieve the grease. Grease everywhere else is perceptible. A filthy habit to put on, and yet it is tolerated to a considerable extent amongst us. All I have to say, gentlemen, is —Do your best to burnish them down; they are so glossy. You can't see their features; burnish them down just to see what they are like underneath. I have taken up too much of your time already, so I will leave your houses and your cases till our next meeting." MARK OUTE.

# Meetings of Societies.

## SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE usual meeting of this Society was held on Friday last, the 14th inst.,—the Rev. F. F. Statham, M.A., President, in the chair.

Mr. J. R. Sawyer gave an account of the rise and progress of carbon printing similar to that given by him in a paper recently read before the London Photographic Society, and published in the number of this Journal for April 23, page 198. He concluded by a practical demonstration of the process of carbon printing as aided by the new transfer paper lately introduced by him.

The CHAIRMAN expressed his pleasure at hearing such a graphic account of carbon printing, and asked if the recent modification was applicable to large works, such as copies of oil paintings.

Mr. SAWYER said that for very large works the flexible support was solely used by the firm of which he is a member, prints forty by thirty-six inches being executed in that way.

A vote of thanks was then given to Mr. Sawyer, who further gave a short description of the use and construction of the actinometer used in carbon printing.

Mr. WILKINSON then read a brief paper on Archer's formula for making collodion and working the collodion process, and inquired why chlorate of silver, as suggested by Archer, for the exciting bath was not now made the subject of experiment. [Mr. Wilkinson's paper will appear in our next number.]

The CHAIRMAN thought that if there was a demand for the chlorate it could be supplied as cheaply as the nitrate.

Mr. FOXLEE was of opinion that such could scarcely be the case, as the nitrate was a by-product, and therefore could be very cheaply supplied.

The CHAIRMAN expressed his sense of the value of occasionally looking back and examining old formulæ, by which much useful information might be gained.

After a vote of thanks to Mr. Wilkinson the meeting was adjourned.

# Correspondence.

## MANIPULATIONS WITH EMULSIONS.

NOTHING has surprised me more than what I read from time to time in the journals about the *shaking* deemed necessary in making emulsons. In saying this I do not refer specially to emulsions made with the addition of silver iodide; these last require neither more nor less than others. I even see it mentioned as an objection to emulsions the trouble required in shaking them.

My own experience has been entirely different. Years ago, in one of my communications to your columns, I expressed the opinion that too much shaking was rather detrimental than otherwise. To fix what is really necessary I made particular note as to the amount of shaking given the last time I prepared an emulsion. The quantity made was between eight and ten ounces. The silver solution was added in four portions, and after each a shaking of about *five seconds* was given. After the last addition the shaking was, as nearly as could be guessed, for one and a-half minute—certainly not more. This was about 8 p m. The bottle was then set aside until 8 o'clock next morning, when a shaking of less than one minute was given, and the emulsion was at once poured out to set. The result was entirely satisfactory. It is true that this represents the practical minimum of shaking; but it shows that there is no *necessity* for exceeding three minutes altogether, even reckoning the little shakings after the partial additions. At the same time it would, doubtless, be safer to shake twice as much. It is only an excessive amount that would be likely to do mischief.

One thing is worthy of special attention. I mentioned it in a communication made several years ago, but it deserves repetition. The bottle in which the emulsion is mixed should never be filled more than one-third, better even less. The quantity of emulsion of which I have just spoken was mixed in a quart bottle. If a bottle be half full it will need twice as much, or more, shaking to produce the needed effect, and if the bottle be nearly full no really effectual shaking is possible. When a bottle is but a third or a quarter full the contents are dashed about violently against the sides in shaking, and a quick and thorough mixing results such as never can be obtained under different conditions. It is not impossible that unsatisfactory results have often depended upon inattention to this point.

Closely connected with this is another matter upon which a good deal of misunderstanding appears to exist. It has been made an objection to all emulsion processes that the mixture needs to be shaken up *immediately before* using, and that it must, therefore, be almost impossible to avoid lumps and grains. This is quite without foundation. It is never necessary to shake up an emulsion immediately before using. Emulsions vary very much as to the time during which they will remain in suspension, but a shaking four or five hours before using is sufficient. I have seen an emulsion which was in good condition for use three or four days after it had last been shaken; but this is rather the exception than the rule. This emulsion was one containing iodide. I do not find that emulsions containing iodide are any more difficult to make, or any more prone to settle, than those which do not contain it. And this I must especially say—that I do not find emulsions containing iodide to give a film of less fine grain than, or in any way inferior to, those containing bromide only. My washed emulsion films are so even that if one look through them out of the window objects are seen with distinctness, appearing almost as if viewed through orange glass. In saying this I refer, of course, to trial films made simply for inspection and examined after simply drying.

In coating with this, or any other emulsion, I always "send back" the wave a second time over the plate, so as to get a thick, opaque film. I did so even with bromide emulsions used with a backing; and where an iodide emulsion is used and backing dispensed with I hold this precaution to be all the more desirable.

I have to-day received the Journal of April 16, with the Editors' report of their experience with the *first* of the new processes I have lately sent. The difficulty mentioned as to the preservative is quite unintelligible to me. Within the last two months I have mixed it some twenty or thirty times, and obtain it so clear that it filters readily *through paper*, or, if the solutions have been themslves filtered, no filtration is necessary after mixing. In my last-mentioned operation no filtering was given. As in my hands this preservative has given a marked superiority over all others for making negatives I will here repeat very exactly my mode of operating:—

I measure out twelve ounces of cold water, and add to it an ounce of thick, clear gum and sugar solution (which last I keep on hand in quantity), and stir up with a rod. I then put in an ounce of prepared albumen and again stir up. I then add an ounce of sixty-grain alcoholic solution of gallic acid and again stir. And, finally, half-an-ounce of a sixty-grain solution of tannin in water and again stir up. The mixed liquid is as thin as water, or, at least, not distinguishably different. It is not absolutely clear, but opalescent, just as a solution of tannin is always opalescent. This opalescence does no more harm in the one case than in the other. If my preservative be filtered through paper it comes through opalescent.

To leave nothing unexplained I give here the mode of preparing the separate solutions, most of which will keep for a year at least, so that, if once prepared and each filtered, it is only necessary to mix in the manner above mentioned, and use at once.

*Gum Solution.*—Dissolve half-a-pound of gum arabic and two ounces of best hard white sugar in forty-four ounces of water. Add one and a-half fluid drachm of carbolic acid. This solution may easily be filtered through paper by using a percolator—a sort of funnel which every experimenter should keep at hand for the easy filtering of viscid liquids.

*Prepared Albumen.*—Take the whites of half-a-dozen eggs, add an equal bulk of water and two and a-half fluid drachms of Beaufoy's acetic acid. Put into a large strong bottle with sharp fragments of glass. Shake well, and then filter through sponge.

*Gallic Acid.*—Dissolve 300 grains of gallic acid in five ounces of alcohol. Filter through paper.

*Tannin.*—A solution in water, sixty grains to the ounce, adding for each ounce five minims of carbolic acid. A convenient quantity—720 grains of tannin, twelve ounces of water, one fluid drachm of carbolic acid. Filter through paper.

The two first are as good when a year old as when freshly mixed. The other two I have never kept longer than a few months.

In making negatives this treatment gives soft and fine films. For transparencies gallic acid and coffee do better, and a little more bromide should be used in development. The gallic acid and coffee may be used for negative work, and it is possible that with some specimens of cotton it may give better results, viz., when the cotton is less intense.

The experiments recorded by the Editors in the Journal for April 16 seem to confirm the value of the new process. It is specially remarked that the collodion being newly mixed a difference from my results must necessarily arise. With an older collodion I think a sensitiveness not inferior to that of wet collodion will be obtained by others as it has been by me. In fact, I am rather surprised that a freshly-mixed collodion should have done as well as those described. The Editors also report a great latitude of exposure, having got closely similar results with an exposure of twenty-five seconds and one of ninety. It will be remembered that I described similar results with still greater disparity of exposure. Of course a very great over-exposure is fatal.

In preparing washed emulsions I find the second emulsification more troublesome than the first—that is to say, there is much more shaking required. The difficulty here is not the getting the silver salts suspended, but getting the pyroxyline redissolved. This substance is apt to become penetrated with the ether and alcohol and to get into a gummy condition, and then dissolve very slowly. Violent agitation is here not so effectual as long-continued shaking. I remember, in the early days of emulsion, when the silver nitrate was added in powder, one of your correspondents described a device he had tried, and which consisted in tying the emulsion bottle securely to one of the spokes of his carriage-wheel before driving out! This must have been very effectual. In the case of a washed emulsion it is not a bad plan to put the bottle in the bottom of a carriage, and let it thus be well shaken up without trouble.

A method has occurred to me which I have not yet tried, but which probably will be useful, viz., to put coarsely-pounded glass into the solvents along with the dried flakes. In dissolving resinous extracts in ether it is a common practice to mix them, after powdering, with three or four times their bulk of clean quartz sand, to prevent this caking, and something of the same sort would, doubtless, be useful in the case of the emulsion. As glass is apt to give up alkali to water it is probable that pounded porcelain or pounded quartz pebbles would be preferable. In any case the finer particles should be washed out and rejected.

It will always give me pleasure to answer any inquiries or aid in solving any difficulties that may present themselves. It should never be forgotten that without a good pyroxyline, suited to this work, nothing but failure can result. M. Carey Lea.

*Philadelphia, May* 1, 1875.

## EMULSIONS AND DISCOVERIES.

*To the* Editors.

Gentlemen,—Mr. M. Carey Lea ought to be grateful to Mr. H. Cooper for having come to his rescue; but, as both yourselves and Mr. Cooper practically admit more or less inaccuracy in Mr. Lea's formula, I do not see that he is much helped.

Mr. Lea says distinctly that "dried" cadmium bromide is to be used, and my dried cadmium bromide will always convert according to formula —eight grains converting ten of silver nitrate. That Mr. Lea did intend pure cupric chloride to be used will appear from a subsequent communication, in which he substitutes another chloride as more certain to be pure, in consequence of having found cupric chloride to vary from its proper strength.

Mr. Cooper is, however, right in correcting my figures for the equivalent of ammonium iodide; but as I find in my notes from which my letter was written "2·343" as the equivalent, I do not understand how in transcribing the error was made, and how I failed to notice it. As I did not see the proof I had no opportunity to correct it, but the error was not in my calculating equivalents, and, this corrected, Mr. Lea's formula would stand *correctly balanced* with an excess of ·834, or a little above three-quarters of a grain, if we use his *maximum* of silver nitrate, and a deficit if we use his minimum.

It may be very true that, as Mr. Cooper says, the common samples of the chemicals admit so much deduction from ascertained impurities that the excess required is given by the use of them; but I have only to say in reply that this is not scientific but empirical chemistry, and anyone who undertakes the teaching to us of photographic chemistry should always state that he uses chemicals of definite purity or impurity. Bromide of cadmium not dried is an uncertain quantity and inadmissible in a chemical formula. We have a right to suppose that a man who professes to teach the chemistry of photography uses substances of definite and well-known value.

Practically I take it for granted that Mr. Lea had a positive excess of silver nitrate, though his directions do not assure it; and my main objections were to his vague and untrustworthy way of stating his "discoveries," and estimating their value, *coupled* with his pretension to scientific exactitude and something which resembles a claim to infallibility. I do not contest his "services in connection with emulsions" for a moment, but it becomes wearisome to hear such a clatter about the motes in our photographic atmosphere. As one of your correspondents pertinently asks—what are "discoveries?"

The photographic world is anxious about its scientific position and credit, and expects the great scientific world to take note that the proportions of gum and sugar in a gum gallic formulæ should be twenty to five, instead of twenty to two. We talk about processes as though there were as many as there are formulæ. I only know of three collodion processes—the wet, the dry bath-plate, and emulsion; and all this vehement discussion about "tweedle-dum and tweedle-dee" is only making ourselves ridiculous. I ask pardon of the photographic world for the part I have taken in it, for I feel ashamed of it, and promise to do better.—I am, yours, &c., W. J. Stillman.

*Merstone, I. W., May* 18, 1875.

[It would be quite useless on our part to enter on any explanation of the matter in dispute on Mr. Lea's behalf. Such explanation will doubtless come in due course from that gentleman himself. We agree with Mr. Stillman that the public "have a right to suppose that a man who professes to teach the chemistry of photography uses substances of definite and well-known value." When the time comes we have no doubt Mr. Lea will be able to show that he does so. But we have also a right to expect that a man who voluntarily assumes the *rôle* of critic should, before making public his ideas, assure himself fully that his calculations and deductions are correctly arrived at, otherwise what reliance can be placed upon his criticism? We must remind Mr. Stillman that in the above letter he has himself to acknowledge an error of some gravity; and but that we prefer to allow Mr. Lea to give his own explanations we might direct attention to at least one other point of a doubtful character. As it will be necessarily some weeks before Mr. Lea can himself reply to Mr. Stillman's remarks, we, under such circumstances, think it but fair to make these observations on behalf of the former gentleman.—Eds.]

## *AURA POPULARIS.*

*To the* Editors.

Gentlemen,—As far as I am personally concerned I have less to complain of than many others of the unfair way in which good work is ignored by some writers. Your columns very frequently contain allusions to "Colonel Wortley's salicine preservative," his "strong developer," his "uranium emulsion," &c., &c.

To take a typical case, however, where I think injustice *is* done: there has been a great deal of writing lately about emulsions—both of collodion and gelatine—being poured out to solidify with a view to their being washed, organified, &c., &c.; but in no one writer's article have I seen the name of the gentleman mentioned who originally proposed such solidification, and to whom, in my opinion, all the credit is due. I think this is a case where a worker's ideas are taken, written upon, and used, and his name never mentioned.—I am, yours, &c.,

*Patent Office Museum, South Kensington,* H. Stuart Wortley.
*London, S. W., May* 17, 1875.

[We imagine that Colonel Wortley is somewhat in error here. Full credit has always been given in these pages to the introducers both of the dried collodion emulsion and the dried gelatine emulsion; and when the history of these important modern processes shall come to be written the fullest *matériel* for such a record will be found in The British Journal of Photography. Meanwhile, if Colonel Wortley be aware of, and desirous of putting forward, any rival inventors or claimants for honours in this connection we shall be glad to enrol their names, should the claims be substantiated, among the Johnstons, Kennetts, Boltons, Leas, and Stillmans who, by suggestion, plodding research, or commercial enterprise have brought these valuable processes to their present important position. —Eds.]

## NICKEL-PLATED ROLLERS.

*To the* Editors.

Gentlemen,—It is generally supposed that the nickel-plated rolling presses are not liable to injury from damp or moisture, but my experience does not bear out this supposition.

A short time ago I purchased one of these presses, with two rollers, and left it out of use for some few weeks, covered up with a piece of woollen stuff. On going to use it again, I was surprised to find the photographs with a dull mark across them, and on examining the press I found both rollers with a sort of rusty mark right across them where they had remained in contact with each other, evidently caused by condensed moisture having collected there. I tried to remove the marks with various plate powders, &c., but with only partial success, a dull line being still left across each roller, which shows slightly on the photographs when rolled.

I expect the only remedy for this state of things is to have the rollers fresh plated, and to keep blotting-paper, or something similar, wrapped round them when not in use. Perhaps my experience may be useful to others, and cause them not to rely too much on these rollers.—I am, yours, &c., NICKEL PLATING.

*May* 17, 1875.

## EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at the small cost of one shilling in our advertising pages. This column is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

Wanted to exchange a camera for plates $8\frac{1}{2} \times 6\frac{1}{2}$, with screw focussing, swing-back and double sliding front, two double and one single dark slides. Will take anything useful. Lenses by good makers preferred.—Address, W. H. J., 213, Walton-road, Liverpool.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

M. L.—By lunar caustic is meant nitrate of silver fused into small sticks.

J. H. T.—We have met with similar spots, but are uncertain as to the cause.

JUVENIS.—The convex surface of a plano-convex condenser must be placed next to the sun.

G. P. R.—The copyright of the photograph is the property of the author during his lifetime, and that of his heirs for seven years after his death.

X. Y. Z.—By whitewashing the chimney and gable the amount of light in your studio will be increased so much as to enable you to reduce the exposures fully one-third.

A. G.—Obtain a manual, purchase apparatus, and make a practical commencement. If you then fail, get a lesson from some one in your neigbourhood capable of teaching you.

B. B (Greenwich).—To produce an enlargement six times greater in dimensions than the *carte*, using a lens of six inches focus, the negative must be seven inches from the centre of the lens, and the sensitive plate forty-two inches.

PROFESSIONAL PORTRAITIST.—There is too little light in your studio. The top pane would require to be seven feet long at the very least, while the side window may with advantage be made ten feet long, and as high as it is possible to make it.

PHOTOLITHO.—Dallastype is a method of making surface blocks for typographic printing, and it differs essentially from Dallas's process of "photelectric engraving," which is a method of etching a plate of metal, and the printing from which must be effected by the aid of a copperplate printer's press.

W. F.—The frosted appearance on silver is produced by heating the article to be acted upon to the verge of redness, and plunging it into water to which about a fourth of its bulk of sulphuric acid has been added. Practise a few times upon coins before attempting to whiten the ornaments upon the album.

REV. S. S.—Our advice has been misunderstood. We do not recommend the addition of alcohol to the developer unless it (the developer) decline to flow over the surface of the plate. The addition of alcohol then becomes necessary, but no more ought to be added than is sufficient to make it flow in this manner.

OSCAR.—Any kind of vessel may be made to serve as a preservative case for sensitive paper, provided it be rendered moderately air-tight and that a small quantity of some desiccating agent, such as chloride of calcium, be enclosed. There is no patent or restriction of any kind connected with the preparation or use of preservative cases for paper.

G. G.—The process which forms the object of your inquiry is not one that is suitable for the pages of a journal devoted to photography, but rather to typography, seeing that our art-science plays no part whatever in the process. In reply to your second query: we are familiar with the details of the process; and to the third query we answer—no.

MISS S——E.—Try the effect of india-rubber finger stalls, selecting very thin ones. Many adopt the practice of wearing india-rubber gloves as a means of preventing their fingers and hands from becoming stained. Gloves of this kind certainly answer the purpose well, although if they fit too tightly they are injurious, owing to their stopping perspiration. Try common kid gloves; but, above all, endeavour to manipulate so neatly as to prevent the fingers from being stained.

P. P (Thurso).—Before oxgall will *keep* it must be boiled in a clean saucepan with powdered alum and common salt. Allow it to come to the boiling point and then remove it from the fire to cool, after which boil and cool again, repeating this three or four times. Finally allow it to settle, and decant into a bottle, adding a few drops of essence of lemon.

MAJOR B.—The camera-stand is too low by at least nine inches. If the camera be small and light it might be advisable to interpose a piece of light, rigid brass tube of the above length between the top of the stand and the camera. The tube should be sufficiently large to ship tightly over the stand, like a ferrule, when it is packed up, and this would not add much, if at all, to the bulk. When erected there would not be any vibration of a nature sufficient to interfere with the stability of the camera.

E. S. (Barrhead).—We shall be happy to see you when you come to London, and shall then show you the negatives. With respect to the film breaking away in clots: this is caused by there being too large a proportion of alcohol of a weak kind to suit the particular sample of pyroxyline that has been employed. By increasing the proportion of the ether the film will be less gelatinous, and possess greater tenacity. The solvents employed in forming the final emulsion should be as free from water as possible.

ISA JACKSON.—We regret to hear of the disaster; but the photograph is not necessarily spoilt—indeed it may be cleaned so as to be as good as it was previous to the upsetting of the ink-bottle. Writing-ink stains can be removed from a photograph by first wetting the surface with warm water applied by means of a camel's-hair brush, and then following with an application of a drachm of oxalic acid dissolved in an ounce of water, this solution being made warm previous to its application. When the ink stains have all disappeared wash the picture thoroughly.

F.R.S.—The explanation of the fact—if fact it be—is to be found in the gradual deterioration of certain kinds of glass by exposure to light. There are some descriptions of glass possessing so great an amount of sensitiveness as to be capable of being printed on. We have seen glass upon which a floral pattern was laid and then exposed to bright sunlight for a few months, the design being printed upon or within the glass after that time. At the Brighton meeting of the British Association Mr. Gaffield, of Boston, directed attention to this subject, and exhibited a great number of specimens of glass which had been discoloured by light.

RECEIVED.—Samples of "Alba" and other varnishes and collodions from Mr. Werge.

☞ **Editorial Communications should be addressed to "THE EDITORS"—Advertisements and Business Letters to "THE PUBLISHER"—at the Offices, 2, York street, Covent Garden, London, W.C.**

WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.—The first excursion for the season of this Society is to take place on Wednesday, the 26th instant, to Bolton Woods (*viâ* Ilkley), starting from the Midland Station, Bradford, by train leaving at 1.35 p.m.; from Ilkley to Bolton by conveyance; returning by train at 8.15. The estimated cost of the trip, including tea, will be about five shillings each. We hope that this young Society will have a pleasant "outing."

## LONDON GAZETTE, *Friday, May* 14, 1875.

PARTNERSHIP DISSOLVED.

MAYALL AND COLLINS, Regent-street, photographers.

## MEETINGS OF SOCIETIES FOR NEXT WEEK.

| Date of Meeting. | Name of Society. | Place of Meeting. |
|---|---|---|
| May 25 ........ | Liverpool Amateur Association. | Free Public Library and Museum. |
| ,, 27 ........ | Oldham Photographic Society .. | Hare and Hounds Inn. |

## METEOROLOGICAL REPORT,

*For the Week ending May* 19, 1875.

Observations taken at 406, Strand, by J. H. STEWARD, Optician.

THESE OBSERVATIONS ARE TAKEN AT 8.30 A.M.

| May. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 13 | 30·30 | W | 55 | 61 | 78 | 53 | Dull |
| 14 | 30·28 | NE | 55 | 62 | 79 | 56 | Dull |
| 15 | 30·17 | W | 59 | 65 | 84 | 58 | Raining |
| 17 | 30·11 | SE | 49 | 53 | 62 | 45 | Cloudy |
| 18 | 29·60 | W | 53 | 59 | 69 | 51 | Cloudy |
| 19 | 29·60 | W | 45 | 51 | — | 46 | Cloudy |

CONTENTS.

THE BRITISH

# JOURNAL OF PHOTOGRAPHY.

No. 786. Vol. XXII.—MAY 28, 1875.

## INCREASING THE SENSITIVENESS OF THE NEGATIVE NITRATE BATH.

It will be in the recollection of our readers that at the recent meeting of the London Photographic Society Colonel Stuart Wortley suggested the desirability of the Society appointing a committee to report, *inter alia*, whether, as alleged by that gentleman, the addition of nitrate of uranium to the ordinary negative nitrate bath did not conduce to the sensitiveness of the plates prepared in such a bath—a suggestion which did not meet with the favourable response from the meeting anticipated by Colonel Wortley. In our remarks on the proposition then made we observed that in a simple matter of that kind it was within the scope of each photographer to make some experiments and decide the question for himself. We now describe the results obtained by a gentleman who has thus submitted the question to the practical test we suggested, and who has obtained very definite results, showing in what direction and to what extent the sensitiveness of a wet collodion plate is influenced by the addition of nitrate of uranium to the silver exciting bath. The experiments were made in the studio of Mr. Werge, of Berners-street, the whole of the operations, except cleaning and coating the plates, being conducted by that gentleman himself. If from a perusal of the details of Mr. Werge's tentative trials, as given here, any reader be led to suggest other means by which the experiments may be more fully, carefully, or exhaustively carried out we shall be glad to be made acquainted with them, or indeed with any mode by which the *experimentum crucis* can be advantageously modified.

We may, first of all, premise that the nitrate of uranium used throughout these experiments was obtained from Messrs. Hopkin and Williams—a sufficient guarantee of its excellence; the collodion, except in a case to be specially mentioned, was one of the best commercial samples procurable in London, and which, with the exception to which we have just alluded, was used in every case.

### Experiment A.

Two negative silver baths were placed in readiness. One was an *old* standard bath of the strength of thirty grains to the ounce; the other was a *new* bath of the same strength, but to which had been added ten grains of nitrate of uranium. A $7\frac{1}{4} \times 4\frac{1}{2}$ plate having been collodionised, was cut in two by a diamond and each half transferred respectively to one of the baths referred to. After being sensitised, they were reunited by being placed side by side in the dark slide and exposed simultaneously—a pair of carefully-matched twin lenses being employed. The two halves were now transferred to a dish of developing solution, in which they lay side by side until the images were developed. On comparing the two pictures produced in the manner described, the one which was sensitised in the uranised silver bath was found to be thin and poor, the other being a negative of the usual density.

### Experiment B.

Whereas in the previous experiment an *old* ordinary silver bath was pitted against a *new* uranised one, in the present case both baths were new, a standard bath having been specially prepared, one half of which was used intact, nitrate of uranium being added to the other half in the same proportion as before, namely, ten grains to every ounce of solution. The treatment of the plate as respects coating, dividing asunder, sensitising, exposure, and development was precisely similar to that detailed in experiment A. In the finished results the advantage was still in favour of the plain silver bath; but there was not such a marked contrast between the two negatives as in the previous experiment.

### Experiment C.

The experiment now to be described was made with an old bath specially prepared and in daily use for photographing children—in short, one of the most rapidly-working baths obtainable in the present state of our knowledge. Nitrate of uranium was again added, in the same proportion as before, to a part of this, and the plate subjected throughout to the treatment already described, viz., one half being sensitised in the plain silver and the other in the uranised portion, the exposure in the camera being that by which the portrait of a child would, under other circumstances, be taken. Here the difference between the two pictures is most marked. The ordinary silver bath negative is fully exposed, and requires no intensification; the uranised negative is very much under-exposed. One is a good negative, the other an underdone positive.

### Experiment D.

This final experiment differed from those previously described in one respect—that, whereas an ordinary, good, ripe, commercial collodion had been used in the others, a new and specially-prepared collodion was now employed. The former collodion was excellent, but its constituents were unknown; hence a new collodion was made, and iodised two hours only before being used. The salts added were in the proportion of four grains of iodide of ammonium and two grains of bromide of cadmium to each ounce of collodion. The bath was newly prepared, one half of it being uranised. Between the two negatives produced under these circumstances the difference is so great as to have led an experienced photographer who saw them on "our editorial table," where they at present remain, to remark that one of them would require ten times the exposure it had received to bring it up to the other. The picture thus under-exposed is that which was prepared in the bath to which uranium had been added.

To recapitulate: the experiments were tried with an old collodion in an old silver and a new uranised-silver bath; with an old collodion in a new silver and a new uranised-silver bath; with an old collodion in an old silver and an old uranised-silver bath; and, finally, with a new collodion in a new silver and new uranised-silver bath.

Only one conclusion can be drawn from the experiments here recorded—the addition of nitrate of uranium to the silver bath not only does *not* conduce to rapidity, as was hoped to have been the case, but introduces an element which positively renders imperative a much longer exposure. As we have presented the *data* on which this conclusion is based it is open to any one or more of our readers to carry out a course of experiments on his or their own account, should further inquiry be thought desirable or necessary.

## UNCERTAIN COMPOUNDS USED IN EMULSION WORK.

Much controversy has arisen at different times, and more especially during the last few weeks, upon the variable composition of some of the substances introduced into emulsions. As this is a point where

precision is necessary, in order to produce results of a constant and reliable nature, it is rather startling to find such well-known emulsion authorities as Messrs. M. Carey Lea, H. Cooper, and W. J. Stillman differing to the extent of grains in the quantity of silver nitrate to be used in sensitising a single ounce of collodion of a given formula.

It may not be a matter of grave importance in the case of an expert in emulsion work, for he is always in a position to verify with more or less truth the correctness of his calculations, or, at any rate, to bring the sources of error, by careful trial, within such bounds as to ensure an uniformly successful result; but for the tyro who works by the formulæ published by others, and is possibly not possessed of the requisite chemical knowledge to enable him to discover where he is wrong, or for those who are by force of circumstances at the mercy of country dealers in obtaining their supplies, the difficulty may resolve itself into one of some magnitude. To such the following remarks will, we trust, be found useful, and may, at the same time, perhaps, offer suggestions to those gentlemen who have been engaged on the analysis of Mr. M. Carey Lea's chloriodo-bromide formula.

The calculations and experiments we are about to record have been made with the greatest care, having been in all cases performed in duplicate, and in some cases repeated with slight variations three or four times. The substances to which we have devoted more particular attention are cadmium bromide, cupric chloride, and *aqua regia*, these three forming the principal "bones of contention" at the present time.

### Ammonium Bromide and Ammonium Iodide.

These two salts we may pass over with brief notice, as, when carefully dried so as to remove any trace of accidental moisture, we have not found them liable to any appreciable variation. When obtained from a respectable house they will be found to answer to the equivalents usually given to them, viz., $NH_4\ Br = 98$, and $NH_4\ I = 145$. It is as well, however, before weighing, to dry them at a gentle heat, or by means of sulphuric acid.

### Cadmium Bromide.

The composition of this salt is a matter of much greater uncertainty. Mr. Lea was, we believe, the first, some years since, to point out that the equivalent upon which previous calculations had been based—namely, $Cd\ Br = 136$—was incorrect, or, at best, very doubtful. More recently he has pointed out that the formula $Cd\ Br + 4\ HO = 172$ of the newly-formed crystals cannot be relied upon, as owing to the efflorescence of the crystals when exposed to the atmosphere the quantity of water of crystallisation contained in the salt is open to continual variation. Furthermore: he has found that the method, usually adopted, of drying the crystals before use is liable to the same charge of uncertainty, as the desiccation does not remove the whole of the water, but only changes the salt to a lower state of hydration. Mr. Stillman has stated that, practically, he finds the cadmium bromide he uses to answer to the formula $Cd\ Br = 136$, but we are sorry to say we have been unable to attain the same result.

Our experiments have been made with quantities of one hundred grains of the crystals as obtained from the chemist. Supposing these crystals to contain four equivalents of water, when exposed to a heat of about 200° Fahr. for some hours a loss of 10·465 grains would represent the removal of one-half, while a loss of double that quantity, or 20·93 grains, would render the salt anhydrous. Practically we have found the loss to be from six to twelve grains with different samples. The difference in results may be traced, in the case of the smaller losses, to the fact of the crystals having been already partially effloresced before weighing and drying; whereas a loss of twelve grains renders it probable that the salt was contaminated with moisture beyond the four equivalents of water naturally due to it, or, perhaps, to a slight loss of the salt arising from carelessness in performing the drying operations. These results, we think, point to the assumption that but two of the four equivalents of water are removed by desiccation at the temperature usually employed—an assumption which was fully borne out by testing the different samples, after desiccation, by means of a volumetric solution of silver nitrate. The whole of the samples agreed (with the exception of variations so slight that they may well have been accidental) with the equivalent, 154, or 9 grains Cd. Br. = 10 grains silver nitrate nearly (9·935 grains).

The double bromide of cadmium and ammonium, as recommended by Captain Fox, offers advantages possessed by neither of the salts singly; and if, as we hope, it can be produced of a certain and definite composition, we shall look to see it drive others out of the field. That *chemical*, in contradistinction to mere *mechanical*, combination takes place in mixing the two salts is proved by the fact that, when triturated with alcohol in a mortar, they form in a few seconds a thick, pasty mass, the cadmium bromide losing its crystalline character, and assuming an opaque, chalky appearance, similar to the dehydrated crystals, after which the whole gradually dissolves. It would appear that the salts enter into combination, the alcohol withdrawing the water contained in the cadmium crystals, the double salt then entering into solution.

### Aqua Regia.

Still greater uncertainty exists as to the actual quantity of halogen contained in this acid than is the case with cadmium bromide. Mr. Stillman has calculated that two mimims of the acid will neutralise 2·487 grains of silver nitrate; Mr. Cooper states the quantity of silver at about two grains; while Mr. Lea, at page 434 of vol. xviii., sets it down at 1·38 grain. These differences may, and no doubt do, arise to some extent from the variable strength of the acids employed by the different gentlemen mentioned; but the distinction between drops and minims has, doubtless, something to do with the matter. Mr. Cooper's calculation appears to us to approach nearer than either of the others to the actual truth, as we shall try to prove. The acid we have employed in working Mr. Lea's formula and in our experiments was made as follows:—

| | | |
|---|---|---|
| Nitric acid ............ | s. g. 1·45 | by weight 100 grains. |
| Hydrochloric acid ... | „ 1·18 | „ 200 „ |

These quantities, when mixed, measured exactly 240 minims. According to Davy's analysis the liquid hydrochloric acid of the above strength contains 36·36 per cent. of real acid, so that the above quantity contains 72·72 grains by weight, or sufficient to neutralise 338·696 grains of silver. A simple calculation will show that two minims will therefore require 1·411 grains of silver nitrate for its complete conversion. We found by experiment that the pipette we employ with this acid delivers it in drops considerably larger than minims, sixty drops measuring seventy-eight or seventy-nine minims—that is, each drop measures as nearly as possible ¾ minims. In calculating the quantity of silver necessary to neutralise two drops it will be requisite to increase the above quantity by one-third; that is, $1·411 + ·470 = 1·881$ grains. It will thus appear that our calculation falls a little short of Mr. Cooper's, whose drops are smaller than ours [see number for May 14, page 232], while it is above Mr. Lea's, referred to previously. The large quantity mentioned by Mr. Stillman is due to the employment of a stronger acid.

The mixed acid used by us, when tested with the volumetric silver solution, proved to be slightly weaker in its combining power than our calculation made it, two drops only neutralising about 1·75 grain of silver. This is, doubtless, owing to the escape of chlorine after mixing the acids.

### Cupric Chloride.

One hundred grains of commercial chloride of copper exposed to a gentle heat for some hours lost seventeen grains in weight, changing its colour to a rusty brown, with the exception of a small proportion, which retained a pale bluish-white tint. It was then dissolved in alcohol without heat, the blue portion remaining undissolved. The clear solution was poured off, and the undissolved portion washed with more alcohol, which was added to the previous solution. The insoluble powder, when dried, was found to weigh nearly ten grains, and when dissolved in water by means of heat gave no precipitate, and but a slight cloudiness, with nitrate of silver. The solution of a cupric chloride, carefully evaporated in a previously-weighed capsule, yielded seventy-one grains of crystals in the brown or anhydrous state. It thus appears that the sample of

cupric chloride employed by us contained about seventy per cent. of pure anhydrous chloride, and, rejecting the percentage of impurity, agrees, as closely as can be calculated empirically, with the formula $Cu\,Cl + 2\,HO$ for the hydrated salt. In this instance the calculation agreed closely with the silver test, two grains of the chloride requiring a little more than three and a-half of silver.

Upon these calculations our interpretation of Mr. Lea's formula, about which so much doubt has been expressed, would stand—

| | | | |
|---|---|---|---|
| 9 grs. Cd. Br. (taking the equivalent at 172) | = | 8·895 | silver nitrate. |
| 2½ „ ammonium bromide........................ | „ | 4·336 | „ |
| 2 „ „ „ ........................ | „ | 2·345 | „ |
| 2 drops *aqua regia* ................................ | „ | 1·881 | „ |
| 2 grains cupric chloride ............................ | „ | 3·541 | „ |
| | | 20·998 | |

This comes between the calculation of Mr. Lea himself and that of Mr. Cooper; but the total difference is so small in comparison with the excess of silver ordered to be used with the formula that we may with justice hold Mr. Lea absolved of the charge of carelessness brought against him.

## ON LANDSCAPE PHOTOGRAPHY.

As a somewhat fitting conclusion to our two articles *On Trees* and *On Clouds*, we think a few words on general landscape work may prove both interesting and useful to, at least, those who are only beginners in the art. There is probably nothing in connection with photography about which more has been written than how best to produce landscape negatives; and that the information and advice thus given has borne much fruit is abundantly evident from an examination of the average run of both amateur and professional work. To such "old stagers" we, of course, do not now address ourselves, our aim being rather, by culling from the experiences of many successful workers, to give in one short article such information as will help the tyro to overcome his earlier difficulties.

Dry collodion, in one or other of its various forms, has now been brought to such a degree of perfection that, amongst amateurs at least, the use of the ordinary wet process for landscape work is the exception rather than the rule; but even with them times come and circumstances arise when, until dry plates are brought to a still higher degree of perfection, recourse will be had to wet collodion. This being the case, it becomes a question of considerable importance how to do the greatest amount of good work at the smallest cost of time and trouble.

We fully sympathise with those whom we have often heard declare that one good negative was worth any number of bad ones, and that even one really high-class picture was considered well worth a day's work. Although, however, this may be true enough, we really cannot see that there is any necessity for being satisfied with one if half-a-dozen, or more, equally good results can be easily secured.

It is a fact, patent to any one who will take the trouble to look into the matter, that, at least in a large majority of cases, where landscape photography is practised by amateurs the result, so far as quantity is concerned, is altogether out of proportion to the amount of energy expended in its production. This is, perhaps, to a certain extent inevitable, and he who will work wet collodion during a hot July day must make up his mind for much hard work; but we are quite certain that in too many cases the work is made much more difficult than it should be by the unsuitable apparatus and absurdly large quantities of *matériel* too frequently taken to the field.

We will assume that the size of plate to be used does not exceed 12 × 10 inches, and that eight or ten good negatives will be considered a very fair day's work. For this amount we are warranted, on the united testimony of many experienced workers, in saying that the necessary chemicals may be carried in a very small basket, which will be found lighter and more convenient than a box; or if that be considered troublesome it may be dispensed with, and the bottles carried in the pocket of the tourist; all that is required being four ten-ounce bottles—one filled with collodion, one with concentrated iron developing solution, one with solution of potassium cyanide, and one with glycerine one part to three of water. In the pocket can also be carried a developing-glass, which may with advantage be graduated, for the more conveniently diluting the developing solution, which we would recommend to be made four times the usual strength. Of the camera, tripod, and tent we need say nothing; every operator will select that which he considers most convenient and suitable to his purse. But we consider that, for efficient working of the best method, two plate-boxes are absolutely necessary — one containing one dozen cleaned and albumenised plates, the other having well-made V grooves in which are to be placed the partially-finished negatives. It will thus be seen that the really essential apparatus and *matériel* for a day at wet collodion need only consist of two packages—the tent and tripod together forming one, and the camera and two plate-boxes the other; while the bottles, developing-glass, and, perhaps, a brush to remove dust from the plate before coating, can be carried either in the pocket or in a small basket slung across the shoulders.

We do not suppose that any operator would think of taking out plates that were not perfectly clean; but as there is sometimes a little difficulty in the performance of even such a simple operation we strongly urge on all the advantage of a substratum of albumen. This is so easily applied, gives with such certainty a chemically-clean surface, prevents the slightest chance of even the most troublesome film slipping from the plate, and can be charged with no possible counteracting disadvantage, that we think its use should be universal, especially with plates above six or eight inches square. We are aware that some have found a little difficulty in the application of the solution of albumen, but there is no possible reason why this should be the case. If the albumen of one egg be added to twenty ounces of water, to which has been added half-an-ounce of strong ammonia, and the whole well shaken for a few minutes, the liquid will, especially after it is a few days old, run through filtering-paper as easily as water, and may be poured on and off the plate in the same way, and quite as easily, as collodion.

Although valuable negatives should be on patent plate, we should recommend those for whose benefit we are now writing to use the description of glass known as "flattened crown." This, just as it comes from the dealer, may be quite sufficiently cleaned by pouring on the surface a few drops of a plate-cleaning solution, consisting of jewellers' rouge half-an-ounce, methylated spirit eight ounces, and water two ounces. This is rubbed with a tuft of cotton-wool in a circular motion for a few seconds, and then roughly polished off with a cotton or linen cloth, the kind sold by drapers as "glass cloth" answering admirably; and a final polish is then given by another piece of the same material. These cloths should be marked "No. 1" and "No. 2," and kept for use in that order. When the plate is cleaned in this way on both sides it should be examined by looking along the edge, when it will be found to be slightly curved, and it is on the concave side that the albumen should be applied, as it will be evident that, if the curvature be considerable, some inconvenience would be found during development if the film were made on the convex side. The albumen will dry in the course of an hour, and the plate may then be placed in the plate-box, and will keep ready for use any length of time.

We counsel young photographers never to be in a hurry in fixing on their point of view, and not to consider time wasted that is spent in examining the picture from every convenient and desirable spot, as they may be sure there is one point which will be better than any other, and that some patience, some practice, and some knowledge of art, too, are required to find it out. In the selection of such points of view special attention must be given to that which is to form the foreground of the picture; and it may be taken and cherished as an article of photographic faith that no picture deficient in a suitable foreground is worth the chemicals used in its production. As an aid to the training required for this kind of work we would recommend a careful examination of the works of our best photographers and artists; and, as a proof of the value of a suitable foreground, the student should, when he finds a picture he considers in every way satisfactory, cover the foreground with a piece of paper, when the effect of its absence will

be abundantly manifest. In all cases where it is possible we would advise a preliminary visit to be made to the scene of operations, when not only the best points may be selected, but, what is of almost as much importance, the hour at which the shadows fall where they will have the best effect. In architecture this is especially the case, but it also applies in no small degree to ordinary landscapes.

The difficulties of truly rendering trees and clouds along with the general picture have already been noticed; but there is another no less difficult subject with which the landscapist has to contend. We allude to the difficulty, if not impossibility, of giving truthful definition to the distance of a picture—of retaining, and faithfully reproducing, that aerial perspective which gives such a charm to the landscape as seen by the eye, and such value to a photograph when it has been secured. This aerial perspective—which is, in reality, in the vicinity of cities, simply the carbonaceous material floating in the atmosphere, and in the open country, especially amongst the glorious "everlasting hills," visible watery vapour—in most cases reflects sufficient light to hide distant objects in a dim obscurity thas is certainly no improvement to the picture. To this difficulty must be added the fact that distant objects, just in proportion to their distance, send a greater number of rays into the lens, and so are generally much over-exposed long before the near objects have been sufficiently impressed. That these defects may, to a large extent, be overcome by judicious manipulation we are aware; but as that is a matter requiring considerable skill, which practice alone can give, we would advise beginners to remain, for a short time at least, content with local "bits"—quiet nooks and corners—which are always charming when well executed, and which will form excellent training for more ambitious work as experience is gained.

Although we strongly insist on sufficient time being given to the selection of a suitable point of view, we are equally anxious to impress on our readers the advantage of economising time in matters where it is profitable so to do; and therefore we have recommended the addition of a solution of glycerine to the tourist's supply of chemicals. The object of this is to keep the plate moist, and so in the best state of getting up the desired intensity on the return from field work. In this way the negative is simply developed with the ordinary iron solution until the detail is sufficiently brought out; it is then washed and covered with the glycerine, and, after being allowed to drain for a short time, is at once placed in the V-grooved plate-box, where it will remain moist for several days. By this means the development of a plate need not occupy more than one minute, and the operator is saved from the exhausting effects of the high temperature inside the tent, and so can with more time and greater comfort go about the work which cannot be done at home; while, at the same time, the operation of intensifying and finishing can be better done in the quiet and leisure of the laboratory or operating-room.

In addition to the articles already mentioned we would suggest—or, rather, we should perhaps say insist on—the necessity of a good supply of blotting-paper and a tolerably large sponge. Amongst beginners especially there is nothing so frequently met with, and nothing that so mars their work, as large blotches in the skies of their pictures. These generally arise from an accumulation of silver solution in the lower part of the dark slide, and are always prevented by causing the plate to rest and drain on a narrow strip of blotting-paper, which should be renewed for each plate. Much benefit is also derived from laying a piece of the same material, moistened, over the back of the plate, and, if it be *red* blotting-paper, it is generally believed that no blurring will make its appearance under conditions in which, without such a precaution, it would otherwise certainly be produced. The sponge should be used moist to wipe the slide after each exposure, and the inside of the camera should also be kept somewhat damp. By this means the pinholes, so often seen in otherwise perfect negatives will, to a large extent at least, be prevented, and the large and annoying class of streaks and surface-markings, produced by partial drying in the desiccated air of the camera under the hot rays of a summer sun, will not make their appearance.

To sum up the whole matter in a few words: we may say that high-class landscape photography is no mere mechanical process, but one requiring for its successful accomplishment the exercise of much artistic talent and photographic experience. To give this free play nothing should be done in the field that can be as well done at home, and nothing carried that can be omitted without detriment. This will leave the operator free to attend to the various smaller matters of which successful manipulation is made up; prevent fatigue, which renders him unfit to realise and, therefore, to reproduce the grandeur of the scene depicted; and enable him to enjoy his day's work thoroughly.

## ON THE ACTION OF THE LESS REFRANGIBLE RAYS OF LIGHT ON SILVER IODIDE AND BROMIDE.

It will be the object of the present investigation to show:—1. That silver iodide and bromide are sensitive to all the coloured rays of the spectrum. 2. That silver iodide is to all the less refrangible rays more sensitive than silver bromide. 3. That the theory of M. E. Becquerel as to the existence of "exciting rays" and "continuing rays" is not supported by a careful examination of the phenomena in question.

The first of these positions differs from those generally accepted in extending farther to the less refrangible end of the spectrum the sensitiveness of both the compounds in question. The second of these positions—that in reference to the comparative sensitiveness of Ag I and Ag Br—differs essentially from the views hitherto accepted, according to which Ag Br has been held to be by far the more sensitive to the less refrangible rays. I shall endeavour to show that the contrary is the case.

In these investigations I have confined myself to studying the effects obtained upon the silver compounds as formed in the body of pure paper, applying in all cases the silver solution after that of the alkaline haloid, and immediately washing out the excess of silver nitrate.

The coloured light was separated by means of coloured glasses. Without wishing to detract from the value of observations made with the prismatic spectrum I am inclined to believe that those obtained with coloured glasses, whose absorption spectra have been carefully and exactly made out with the aid of spectroscopic analysis, are at least equally reliable, and, in some cases, certainly more decisive. It is also to be remarked that prismatic solar spectra, as usually obtained, are open to the suspicion of not being absolutely pure, but liable to admixture of rays coming from light falling upon the prism outside of the true image of the slit, by reason of diffraction, and also, possibly, from other sources. A very careful prismatic analysis of the spectrum itself would be necessary to detect the presence of faint violet light cast by any such means on the red end of the spectrum. With coloured glass, on the contrary, the detection of any such admixed colour may be accomplished by a simple inspection of its absorption spectrum. If it be suspected, for example, that a given piece of red glass, or any number of pieces, permit the passage of a trace of violet light, the spectroscope gives us at once a decisive answer, because we can project any such violet light that may be present against an absolutely dark field of view, and decide positively on its presence or absence. Another serious difficulty with the spectrum arises from the very long exposure which is necessary to make apparent the effect of the less refrangible rays, and which long exposure can be less advantageously managed with the solar spectrum than with coloured glass.

Still another advantage in the use of coloured glass is that the pieces used can be of any desired size, so that one can operate over a large space and simultaneously expose several preparations to identical influences, and thus obtain a more accurate comparison than is possible with the successive exposures necessary with the solar spectrum. By interposing a suitable glass negative between the coloured glasses and the paper the effects of the exposure are rendered much more marked; the distinctness of the reproduction of the image of the negative serves in each case as a measure of the degree of sensitiveness. This has a particular importance when a development process is used, because, even with the utmost care, there will sometimes be a discolouration arising from the action of the development bath. And if the arrangements are such that the action of light produces a flat tint only it may easily become impossible to distinguish between the effects due to the development of an impression of light and those depending upon a spontaneous deposit from the bath; moreover, this spontaneous deposit is most apt to occur, in the case of a very weak impression, exactly where it is most likely to induce error. The employment of a negative avoids this difficulty, and if its image have a great variety of tones the observer is able to measure very closely the relative extent to which it is reproduced on the sensitive surface.

*Direct or Developed Images.*—A certain amount of ambiguity has been introduced into what has been published on the subject of the sensitiveness of silver salts by not distinguishing in all cases whether the sensitiveness spoken of relates to images which appear during the exposure or are subsequently evoked by development. The capacity to form developable images is, in all cases, the true test of sensitiveness; any other criterion would lead to most erroneous conclusions. In this paper it will always be understood, except when otherwise mentioned, that the sensitiveness referred to is that which is exhibited under a development by means of gallic acid and silver nitrate, controlled by acetic acid.

The papers used were first floated on weak solutions of potassium iodide and bromide respectively, using them in equivalent proportions, so that each might take up an equal quantity of silver from the silver bath. This last was always made of the same strength, viz., thirty grains to the ounce, and a fresh solution for every piece, because, as silver iodide and bromide are soluble in solutions of silver nitrate, there

might otherwise result a transfer and the formation of appreciable quantities of silver iodo-bromide, the reactions of which substances are different, and so energetic that the presence of the least trace would destroy all value in the results obtained. For the same reason the potassium salts employed must be pure. Therefore the KI and KBr, which were exclusively used, were submitted to careful examination at the outset. The results subsequently obtained as to sensitiveness of AgI were so different from what had hitherto found acceptance, that it was deemed advisable at the close to submit the KI to a second rigorous examination for bromine. This examination fully confirmed the first conclusions as to the absolute purity of the specimen used.

The papers were next blotted off in clean filtering-paper (because if hung up to dry the lower end becomes more richly charged than the upper), and, after complete removal of the surface moisture, were floated on the silver nitrate solution. They were next thrown into a large vessel of water, washed with running water, and dried. In a few cases specially mentioned the silver solution was allowed to dry on the paper for comparative experiment.

### Red Rays.

*Examination of the Glass.*—The ruby glass of commerce differs very much in different specimens; some pieces, though appearing to the eye to be of a strong, pure red, nevertheless transmit a good deal of green light, and show in the spectroscope a strong green band. Other pieces are of a much purer colour; but I have never met with any, even the darkest, which did not, with a critical examination, show in their absorption spectrum traces of the more refrangible rays. The band which represents the proper colour extends from very near the extreme red end to a point a little beyond the double sodium line D.

When two such pieces are superposed the trace of more refrangible light is excluded; the proper band of colour is also shortened at its more refrangible end and recedes to the other side of D. Two pieces—a dark red and a medium red—gave as their limit a wave-length λ 594. Two dark pieces, superposed, had a limit of λ 600. A large number of experiments were made with the combination last mentioned; but as it was my desire to make these investigations, as far as possible, absolutely correct all my results were revised, and confirmed by final trials with light filtered through *three* thicknesses of ruby glass. These showed as the limiting wave-length of their absorption spectrum λ 605—a limit which totally excludes the yellow, and represents the red rays with, at most, a slight admixture of orange, as the light at and near this limit of λ 605 was extremely feeble, and the whole strength of the band found its place beyond. The measures here given were repeated a number of times on different days with concurrent results.

*Result.*—With *two red plates*, having a limit of λ 594, a strong, *direct* image was obtained upon the iodide paper by an exposure of fifteen minutes to bright sunshine. The bromide paper, exposed under the same glasses and negative, simultaneously, showed nothing. By a very long development exceedingly faint traces of an image were rendered visible. The contrast between these two was very striking.

With *two stronger red plates*, having a limit of λ 600, and, of course, a diminished illumination, no trace of an image by development could be obtained on the silver bromide paper after exposures of various lengths up to an hour and a-half of brilliant sunshine (from 12.15 to 1.45 P.M., Jan. 30, 1875, bright sunshine on snow).

On the contrary, silver iodide gave, after 20′ exposure, a developed image showing some detail, and after 40′ exposure a faint, *direct* image visible without development.

With *three red plates*, having a limiting wave-length λ 605, there was necessarily a further great diminution of illumination. Nevertheless, silver iodide gave with thirty minutes' exposure (middle of the day, bright sunshine on snow, February 1, 1875) a faint, and with four hours' exposure a full, image. February 2, three hours' exposure gave an image showing considerable detail. February 5, same result. These were, of course, all developed images.

The corresponding bromide papers, receiving identical exposures under the same glasses, side by side with the iodide, absolutely failed to develope anything. These developments were prolonged for several hours in order that the faintest traces, if present, might render themselves visible; but in no case did silver bromide, when exposed under the three red glasses, show the faintest trace of any image, even with a four hours' exposure. That silver bromide is not only destitute of sensibility to red rays was shown by the previous experiments, but this sensibility was small; and when the red light is not only very pure, but very faint, it may be exerted for a very long time without result. Still I believe that with a day's exposure under a strong summer sun an impression capable of development could be produced. On the other hand, in no case, even with exposure as short as half-an-hour to a winter sun, did silver iodide fail to give an image under these three ruby glasses, whose faintest light terminated at λ 605. It appears, therefore, certain that both silver iodide and silver bromide, prepared on paper with excess of silver nitrate removed, are distinctly sensitive to red light, and that silver iodide is, under these conditions, at least ten times as sensitive as silver bromide.

### Yellow Rays.

It is by far more difficult to isolate yellow rays than either red or green, because almost all media that transmit yellow rays also transmit red, and may also transmit green. The yellow glass that is found in commerce lets through the whole spectrum, except the extreme violet end, and for a time I thought that the isolation of the yellow rays by coloured glass would be impracticable. I finally succeeded very well by combining a deep brown glass with a dark green. The brown glass transmitted the yellow and red, absorbing the rest, and the dark green admitted principally green and yellow, cutting off the orange and red.

A spectroscopic analysis gave the following results:—

Extreme limit of wave-length at less refrangible end of the spectrum .............................. λ 638.
At more refrangible end .............................. λ 527.
Point of maximum illumination .............................. λ 570.

The limits here given are extreme limits at which the absorption spectrum ended. It was estimated that *at least* nineteen-twentieths of the illumination was pure yellow, with perhaps a very faint admixture of orange and of the less refrangible green rays bordering on the yellow (any close observation of the spectrum will show how little pure yellow light it contains).

*Result.*—Silver iodide showed itself also more sensitive to yellow light than silver bromide, but the difference was greatly less than in the case of red light and the results were more variable. February 4, 1875, with exposure to bright sunlight from twelve noon to three P.M., distinct images were got by development on silver iodide, whilst in four trials of equal length on bromide paper nothing was got. On the following day, with an exposure of equal length, but before midday, well-marked images were obtained on silver bromide. Those obtained at the same time on silver iodide, exposed side by side, developed to an equal strength in one-third the time.

I conclude, therefore, that silver iodide and bromide are both sensitive to yellow light, and the iodide more so than the bromide.

### Green Rays.

Much of the green glass found in commerce admits nearly the whole spectrum, except the red rays. There exists, however, a very dark shade of green, which narrows the transmitted band very much. When two such pieces of dark green were superposed their absorption spectrum was as follows:—

Extreme limit toward red end .................. λ 601.
Extreme limit toward blue end .................. λ 488.

This last limit corresponds very nearly with the solar line F, whose wave-length is 486, and which approximately separates the green from the less refrangible blue. For exact experiments, however, a narrower band is desirable. Accordingly three plates were superposed. This involved such a reduction of illumination that the sun could be viewed through the glass without inconvenience. This combination gave the following measurement:—

Extreme limit toward red end .................. λ 581.
Extreme limit toward blue end .................. λ 497.

Near these limits the light was extremely faint. To ascertain the ray of really effective strength transmitted by this combination of plates another measurement was taken, resulting as follows:—

Effective limit toward red end .................. λ 569.
Effective limit toward blue end .................. λ 517.

The portions of the band which lay between λ 569 and λ 581 on the one side, and λ 497 and λ 517 on the other, were so extremely faint as to have no appreciable agency in affecting the result.

It will be observed that even the limit of the faintest rays does not extend as far as the solar line F; the blue is, therefore, absolutely excluded. Toward the yellow side even the faintest rays do not extend so far as the sodium double line D, and the effective rays terminated at λ 569. The yellow is, therefore, virtually excluded.

*Result.*—With two dark green glasses (λ 488—601). A powerful image was developed on silver iodide after three minutes' exposure. On silver bromide the same exposure gave faint traces of an image only. The exposure of an hour and a-half failed to produce on silver bromide as strong an impression as did the three minutes on the iodide.

An exposure of forty minutes gave on silver iodide a plain, direct image; with ninety minutes no direct image was produced on silver bromide. Other exposures and degrees of exposure gave concurrent results.

With three dark glasses (extreme limit λ 497-581, effective λ 517-569). Silver iodide gave the following results:—Two and a-half minutes, faint image developed. Six minutes, distinct; fifteen minutes, strong; thirty, very full exposure; three hours and a-half, completely overdone.

Silver bromide—two and a-half and six minutes, nothing; fifteen, faint trace; thirty, a little stronger; three and a-half hours, moderately strong.

Comparing the above—AgBr with fifteen minutes about the same as AgI with two and a-half; AgBr with thirty minutes not quite so strong as AgI with six; AgBr with three and a-half hours much the same as AgI with fifteen minutes, if anything less strong. Other trials gave conformable results.

The conclusion seems, therefore, irresistible that AgI and AgBr both are sensitive to pure red, yellow, and green rays; and that AgI, at least under the conditions of these experiments, shows to yellow rays a slightly superior, and to green and red rays a markedly superior, sensitiveness.

*AgI and AgBr Together.*—Although the scope of this investigation was direct to the action of pure AgI and pure AgBr a few experiments were made on the two used together. They were used in equivalent proportions, and in such quantity that the paper containing the two salts together should take up exactly as much silver as the papers prepared with AgBr and AgI separately. The result demonstrated a materially greater sensitiveness to both red and green light than with either used separately. The experiment was not extended to the yellow, but it would doubtless have given similar results, as also the more refrangible rays of the spectrum.

[It may be worth mentioning, in passing, that the result of this part of the investigation led to the making of a series of experiments on the introduction of silver iodide into the "emulsion process" for preparing photographic dry plates. The result was that when either equal or equivalent quantities of AgBr and AgI were employed nothing material was gained; but when the quantity of AgI was much reduced, and especially when AgCl was added, plates were obtained possessing a degree of sensitiveness much beyond anything heretofore attained by any collodion method, either wet or dry. A fully-exposed image was obtained by an exposure under a negative to a gas flame for one second. The details necessary to the production of this result have been communicated to the Photographic Society of Philadelphia.]

*Sensitiveness to White Light*—Although this investigation was directed to the action of certain coloured rays a few experiments were included upon the comparative action of white light on AgI and AgBr. There was found a moderate superiority of sensitiveness in AgI, though much less marked than in the case of the red and green rays. Exposure under a negative for three seconds to a weak diffused light sufficed to produce a strong latent image on both the AgI and AgBr papers, but not strong upon AgI.

*Influence of Free Silver Nitrate.*—The presence of free silver nitrate in a film of AgBr considerably increased the capacity to receive a latent image, but its agency in producing a direct image was still more marked. Thus an exposure of ninety minutes under two green glasses (limits $\lambda$ 488—601) failed to produce any visible image on washed AgBr, whereas when the paper contained free silver nitrate a plainly-visible, direct image was obtained in forty minutes.

As respects silver iodide my opinions have always differed from those which have prevailed among photo-chemists. Many years ago I proved the opinion that silver iodide, absolutely isolated, was insensitive to light to be erroneous. I covered glass plates (preferably ground glass, for better adhesion) with thin, specular films of silver, and then iodised these through and through by means of a solution of iodine, and succeeded without difficulty in developing images received on such films.

The opinion also that silver iodide, in the absence of free silver nitrate, is comparatively insensitive receives its disproof from the foregoing investigation, which decisively shows that washed films of silver iodide possess a high degree of sensitiveness to white light and some sensitiveness to the less refrangible rays; in either case a higher degree than silver bromide.

### "Exciting" and "Continuing Rays."

More than thirty years ago M. E. Becquerel published his well-known theory of the existence of two classes of rays—the "exciting" and the "continuing" rays. According to it, the more refrangible rays had alone the power of originating an impression; the less refrangible were powerless to commence, but capable of continuing and reinforcing an impression which had been commenced by the more refrangible rays. This view is still maintained by M. Becquerel in his comprehensive work, *La Lumière*, published a few years since, and is adopted by Janin, Ganot, and others in their treatises on physics, though the acceptance has been far from universal.

The foregoing results are evidently quite incompatible with this theory, for they prove the existence in the less refrangible rays of the power to impress both silver iodide and bromide. In only one way could this testimony be set aside, namely, by the allegation that these papers might have received, in the course of their preparation, some chance effect of light sufficient to lay the foundation of an impression, and that this was afterwards continued only, not originated, by the coloured light to which the papers were subsequently exposed.

It would seem to be a sufficient answer that all due care was taken to avoid the danger, and, as the experiments themselves showed, successfully. Such an uncertainty might exist with experiments made with the spectrum, but not where, as in these investigations, a negative is interposed; for, according to M. Becquerel, the preliminary impression of light which is necessary in order to enable the less refrangible rays subsequently to exert their continuing power on AgBr, AgI or AgCl formed on paper is that which would enable them to receive a development by gallic acid, &c. When this impression has been received the less refrangible rays can continue this commencement, and this result may be obtained either with the spectrum or with coloured glass.*

But, as in my experiments the latent images were always developed with gallic acid, it follows that, had the images evoked been due to a continuing power of the coloured light upon an original impression caused by light accidentally admitted during the preparation, then the papers must have darkened all over by the agency of gallic acid, instead of developing an image. So that the system of experiment adopted was in itself incidentally a precaution against any such source of error.

Nevertheless, wishing to obtain a result that would be entirely decisive, paper was prepared for this special purpose under conditions of exceptional care. It was prepared at night, using light not only most carefully guarded by coloured glass, but as little of it as was possible to manipulate by. Even this faint light was carefully excluded from the preparations. The paper was covered whilst being sensitised on the silver bath, and was then washed with special precaution and dried in absolute darkness. As soon as dry it was placed in the frames and under the glasses under which it was to be exposed next day. The precautions taken enable me to say that most certainly the paper received in its preparation no effect of light capable of influencing a development in any way. Its action proved to be precisely the same as that of the paper prepared in my usual way, thus demonstrating that all the rays of the spectrum possess the power of originating an impression on silver iodide and bromide.

In the foregoing paper I have briefly given the result of one hundred and sixty experiments. The results, with such slight and altogether unimportant variations as necessarily arise from slight differences of preparation and differences in the character of the sun's light, were remarkably concordant, and may be summed up as follows:—

1. AgBr and AgI are sensitive to all the visible rays of the spectrum.
2. AgI is more sensitive than AgBr to all the less refrangible rays and also to white light.
3. The sensitiveness of AgBr to the green rays was materially increased by the presence of free silver nitrate.
4. AgBr and AgI together are more sensitive to both the green and red rays (and probably to all rays) than either AgI or AgBr separately.
5. There do not exist any rays with a special exciting or a special continuing power, but all the coloured rays are capable both of commencing and continuing the impression on silver iodide and bromide.

M. Carey Lea.

* *La Lumière* vol ii., p. 26.

## REFLECTION FROM BACK SURFACES.

In photographic works we frequently find allusion made to the reflections from back surfaces of glass. For instance, in The British Journal Photographic Almanac for 1871, page 45, in an article on the production of inverted negatives, the remark occurs—"the reflection from the back surface is so good." Similar allusions in reference to plates of glass occur in various numbers of the Journal, upon which, after a little search, the reader may lay his hand. Whether or not it is supposed by physicists that the reflections are effected from some supposed *inner* surface of the glass is a point on which I have failed to find a direct statement made by any optical authority. This view, however, has been propounded in this Journal, and is again reiterated by Mr. W. B. Bolton in a recent issue [*ante*, page 224], where the terms "reflected internally" and "internal surface" are employed.

It appears to me that such terms do not express the actual state of things, and are, in fact, misnomers. "Reflection," as I understand the word, is the rebound from surfaces capable successfully of resisting penetration. If, however, penetration be effected it is difficult to apprehend how the back surface can prevent extrusion. We can readily understand a ball projected against a hardened plate of metal rebounding from its surface; but it is not easy to comprehend how, if penetration have taken place, the further side should present obstruction to the exit of the ball and cause it to return through another thickness of the plate. Nor is it easy to comprehend why, in the case of vitreous prisms, reflection from an *inner* surface should exceed reflection from the outer. (See The British Journal Photographic Almanac for 1871, page 45.) Indeed, to speak with strictness, there is no inner surface to reflect from. That which has only length and breadth, being destitute of thickness, cannot have two sides, and a solid must have outer surfaces alone. A surface not being an entity at all, but merely the part of space in which a body ends, is it not absurd to make allusion to its inner side and to reflection taking place therefrom?

It has been found that the halation caused by reflection from beyond the film is diminished, if not destroyed, by a non-actinic pigment in optical contact with the ulterior surface of the glass; and yet the surface of the glass exists the same, and its *inner* surface, if it had one, would be absolutely undisturbed. The action of the pigment appears to prove that the reflection which certainly takes place is from *beyond* the outer surface of the glass and from a medium rendered inaccessible to light by the pigment on the plate; and the medium in question I apprehend to be the atmospheric air moulded to a surface by the glass.

Optical reflection from the surface of a gas is not a new idea, mirages being attributed to that cause.* I have not, however,

* *Physics.* By Balfour Stewart. Second edition, page 236.

chanced to meet with any allusion to reflection from a gaseous surface in contact with a figured glass, but I think it may be laid down as a fact that reflections of the kind take place. Certain theoretical considerations of much interest follow from this view, but to these I will invite attention at some other time. Meanwhile I place these few remarks on record, where I may find them at a future time and utilise them as the basis of experiments.

D. Winstanley.

## MR. M. CAREY LEA.

It will readily be conceded that to write an article of a personal or biographical nature concerning a *confrère* who, we are happy to say, is still not merely living, but, as his communications show, sedulously engaged in tentative and important inquiries, is a task not quite free from difficulty. The perplexity of the "situation" is greatly increased by the very profusion of the topics placed at our disposal—the richness of the biographical bill of fare; for with the name of Mr. M. Carey Lea—the subject of our present sketch—is associated so many profound researches connected with the varied departments of our art-science—the optics, the chemistry, the manipulation, the æsthetics, and even the mechanics of photography—that we are placed in the position of one labouring under an *embarras de richesses.*

The name of Mr. M. Carey Lea was first known to the readers of The British Journal of Photography in October, 1864. Soon after that period Mr. Lea succeeded Mr. Coleman Sellers as our American correspondent.

Before entering on our *résumé* of the labours of Mr. Lea as a public man in connection with photographic progress, we may in a few sentences take our readers into our confidence by observing that he is of English descent, the recorded incidents of his family history dating as far back as 1680, in which year his forefathers crossed the Atlantic under the auspices of William Penn, while two years afterwards (in 1682) Penn himself became a permanent resident in the colony he had founded. Mr. Lea was born in Philadelphia in 1823. For many years he has lived in the northern suburbs of that city, in a beautiful hilly district known as the "Chelten Hills," where he has a laboratory very completely arranged. His pursuits have not been confined to natural science, but have also extended to the study of languages. Mr. Lea, we may observe, is in the enjoyment of what is known in this country as "easy circumstances." Possessed of a cultivated taste, a mind of a logical and analytical order, a liberal education, and of means enabling him to gratify refined tastes, is it any wonder to find him a devotee at the shrine of that department of applied science—photography? Having long suffered from a severe malady affecting his voice he has been obliged, as far as possible, to avoid all severe strain on his vocal organ, which circumstance has partially deprived him of what we feel assured would otherwise have been a source of pleasure to him, namely, making the personal acquaintance of chemists, scientists, and photographers of repute in Europe.

On the occasion of Mr. Lea's last visit to this country, when we made the personal acquaintance of one with whom we had been so many years in editorial *rapport*, we were grieved to find that the state of his health was such as to unfit him for availing himself of our expressed desire to introduce him to some of the leading scientific photographers of the metropolis at a social gathering; for we felt assured that all who take a profound interest in the art and science of photography would only be too glad to have an introduction to a man whose name, on this side of the Atlantic, is to every reader of photographic literature "familiar in his mouth as household words."

M. CAREY LEA,

FROM A PHOTOGRAPH BY M. CHAMBAY, OF PARIS.

It is well known by Mr. Lea's friends that he possesses two very remarkable collections—one, a cabinet of about one thousand specimens of chemical products, chiefly crystallised and prepared by himself; the other, what is probably the finest collection in America of drawings by the great masters. These he collected in Italy, where his long stay and his familiarity with the language gave him unusual opportunities for indulging his taste in such artistic "annexation." In this noble collection, which numbers about two thousand distinct examples, are included excellent works of the present century and of that immediately preceding, and a few originals of the older masters in this his favourite department of pictorial art.

Although, as we shall presently show, Mr. Lea is devoted to chemical and physical science, yet physical *exercise*—at least of one kind—disputes the supremacy of his devotion to science; for we learn on the best authority—although we hardly like to "tell tales out of school"—that he daily dedicates several hours to driving, and that he thinks quite as much of his skill in handling the reins as of the purely scientific attainments with which his name is more particularly identified.

Mr. Lea commenced the study of chemistry, from natural bent, at a very early age. At a later period of life he passed some years in the analytical laboratory of Professor Booth, of the University of Pennsylvania, who was himself a student of Wöhler's. By over-study in various departments of physical science he, at the age of twenty-three or twenty-four, had completely broken down a strong constitution, and was obliged to travel in Europe for several years, ultimately returning home to resume his studies and researches.

The following is a condensed record of Mr. Lea's contributions to chemistry, photo-chemistry, and practical photography:—

Among the first communications made direct to this Journal by Mr. Lea, if not the very first, was a brief treatise on an all-important, although somewhat humble, class of subject—a method of rendering glass plates thoroughly clean. He had long previously been in the habit of removing portions of organic matter, which obstinately clung to chemical vessels, by means of chromic and sulphuric acids; and he reasoned that, as the dirt on new plates was altogether organic, it would be easily removable by the same means. He found that it not only did so in an effectual manner, but also removed old films from previously-used plates. The method then described is now extensively adopted in large studios; but as it has been so often reproduced in our Almanacs to detail it here is needless. In November of the same year (1864) he published a formula for a new toning-bath, in which benzoic acid played a part. This bath produces a warm, purple-black tone. In the following year he contributed no fewer than forty-three papers on photographic subjects, some of these being on investigations into the action of light on iodide of silver, while others were of a more practical character, such as modifications of Pretsch's photogalvanographic process, on the management of waste nitrate of silver, on a new carbon process, on the nature of the latent image, on the conditions of development, on the reduction of over-printed proofs, on photographic reproduction of lustre, on the equivalent foci of lenses, on a new developer for negatives, and on many other topics. It was in this year he published two processes of exceptional value, and which gave rise to very much controversy at the time, namely, his beautiful process of chlorising negatives and afterwards converting them into a rich scarlet colour, and the well-known ferro-gelatine developer. Scarcely had the advantages of gelatine as an addition to the iron developer began to be appreciated ere some photographers of eminence immediately declared their intention of discontinuing the future use of pyrogallic acid as a means of obtaining intensification.

In the following year, out of between thirty and forty communications to this Journal, we may mention those on the action of iodine and alkaline iodides upon the latent image, on the blistering of albumenised paper, on an examination into the circumstances under which silver is found in the whites of albumen prints, on the sensitiveness of iodide of silver to light, on the latent image, on the action of cyanide of potassium on photographs, on the detection of iodine when present in combination with a base, on the influence of iodine and bromine on collodion, on photographic perspective, on the nature and influence of tannin, &c., &c., &c.

But to attempt to give even a mere outline of Mr. Lea's further contributions in connection with photographic science would conduce to make this article unduly long. From two years given by way of sample, and during which period Mr. Lea was also acting as American correspondent of this Journal, our readers may readily deduce the indefatigable nature of the investigations and writings of the gentleman of whose labours we are attempting to present a feeble digest. It is sufficient here to say that a very large number of articles from the prolific pen of this accomplished writer have graced the literature of our art-science, its scientific *repertoire* has been increased by numerous original investigations, and a profusion of valuable hints have been added to the pre-existing stores of practical photographic knowledge.

It was at the latter end of 1867 that Mr. Lea commenced those experiments in connection with collodio-bromide emulsion which he subsequently brought to so successful an issue. Speaking* of this process as the best to adopt as a basis of experiment, he says:—"I set out to find whether it could not be possible to obtain a substance which, simply added to the collodio-bromide, would act as a preservative. If this could be done the whole labour of preparing the plate would be reduced, after the collodion was poured on, to a simple washing and drying." In the course of his investigations he found that oleate of silver, gum guiacum, benzoic acid, shellac, gallic acid, glycerine, and other bodies, when added to the emulsion, were found to fulfil, in a greater or less degree, the desired requirements. Soon after the period above mentioned (in December, 1868) he writes, in connection with emulsion processes:—"I am determined, if it be possible, to have a dry process as rapid and certain as the wet if such a thing be attainable, as I believe it to be. I have been at work steadily for a long time to reach this, and have made a vast number of trials." Is it, therefore, any wonder that in the following year (1869) we were enabled to write as follows:—"Let us congratulate our friend and correspondent, Mr. Lea, upon having brought to such a successful issue his investigations in connection with the chloro-bromide of silver, resulting in the publication, in the present number, of a process which will, we believe, prove of great value." A noticeable feature in the new process was the fact, as stated by the author, that "a liberal excess of nitrate of silver in the collodion tends to exalt the sensibility, but obliges great care to be taken in the development, and the use of plenty of bromide of potassium; but by the introduction of chloride all this tendency to fog disappears at once, and the development goes on as brightly and clearly as can be desired." After the publication of this paper, in December, 1869, by which it was shown that sensitiveness could be imparted to this hitherto slow process, emulsion photography advanced with rapid strides; and not even Mr. Lea, to whom it owes so very much, can venture to say when that advance is to terminate.

Some time ago Mr. Lea published a *Manual of Photography*, which is an invaluable work, and is now in its second edition.

We have alluded to Mr. Lea's chemical investigations apart from photography. Among the subjects to which he has devoted attention are the ethyl and methyl ammonias, on which he has written several papers. One part of his studies in this direction resulted in the discovery of a new method of forming methyl ammonias, which method now forms the basis of the aniline colour manufacture. The *Bulletin de la Soc. Chimique*, referring to this when speaking of the prominent place nitrate of methyl occupies in the manufacture of colours, says:—

"Carey Lea in 1862 showed that it might be substituted in the majority of chemical reactions for iodide of methyl, especially in the preparation of methylamine, dimethylamine, &c. Since then it has been successively applied by Hugo Levinstein in the manufacture of violet derivatives of rosaniline in 1864; in 1866 by Poirier and Chappat in the preparation of the methylic bases of aniline, such as methylaniline, dimethylaniline, &c. Lastly, it has been used, almost simultaneously in France, Switzerland, and Germany, in the manufacture of the green derivatives of rosaniline violets, or those derived directly from the dimethylaniline violets. Since 1863 this body has almost entirely replaced the iodide of methyl."

* THE BRITISH JOURNAL OF PHOTOGRAPHY, vol. xv., page 14.

In bringing this biographical notice down to the most recent dates we may mention Mr. Lea's researches on light as representing physical science, while his new chloriodo-bromide emulsion process may be given as the result of his latest experiments in applied science.

It will be remembered that, some months ago, Dr. Vogel introduced a new theory of the action of light upon silver bromide in combination with certain other substances, his experiments leading him to believe that the sensitiveness of that salt to the coloured rays of the spectrum was heightened by the presence of substances capable of absorbing such coloured rays. This theory Mr. Lea combated, his opinions agreeing with those of other well-known scientists. The sum of his researches was that, though he had found many substances which increased the sensitiveness of silver bromide to particular rays, they were, in most cases, colourless, there being no reason to believe that any relation existed between such increase of sensitiveness and the colour of the exciting substance employed. A summary of Mr. Lea's ideas on this point will be found in our last number. We publish this week another important communication in which Mr. Lea shows that the previously-accepted idea that silver bromide was more sensitive to the less refrangible rays than the iodide is erroneous. He proves by numerous experiments that, while the whole of the visible rays of the spectrum are capable of actinic action upon both silver iodide and silver bromide, the former is the more sensitive to the less refrangible rays as well as to white light, while Ag I and Ag Br together are more sensitive than either separately.

The value of the chloriodo-bromide process, which is still upon its trial, has already been recognised by so high an authority as Mr. H. Cooper, and our own experience is greatly in its favour. Let us express a hope that our valued contributor, whose powers are now in their full vigour, may long be spared to continue his researches in connection with photography and other cognate branches of science in which he has already achieved an enduring reputation.

The portrait from which our engraving has been made was taken by M. Chambay, Paris, during Mr. Lea's late visit to Europe.

## ARCHER'S FORMULÆ.

[A communication to the South London Photographic Society.]

THE name and discoveries of Mr. Frederick Scott Archer having been brought very prominently before the photographic public of late, perhaps a statement of his formulæ, as published by him in 1854, may be interesting to the members, and also curious as showing how really little change has been made in the process since he gave it freely to the world.

For *collodion* he recommended—

| | |
|---|---|
| Sulphuric ether | 1 ounce. |
| Gun cotton | 3 grains. |

*Iodising Solution.*

| | |
|---|---|
| Alcohol | 1½ drachm, |
| Iodide of potassium | 2½ grains, |
| Fluoride of „ | 1 grain, |
| Bromide of „ | ½ „ |

with the addition of alcohol if the collodion did not flow smoothly.

*Exciting Bath.*—Mr. Archer says that the salts of silver available for this purpose are those soluble in water, and they are used alone, or by admixture with each other. They are the nitrate, the chlorate, and fluoride of silver.

The nitrate and chlorate, however, are the only two that can be used with any advantage—the former from its greater cheapness, although the chlorate, could it be obtained at a reasonable price, would be found the better of the two, as producing a more sensitive surface in solution and not so liable to change. The nitrate of silver solution should be prepared with crystals and distilled or rain water, and to secure the greatest sensibility the solution should be perfectly neutral.

After giving various hints as to testing for fog, &c., the following formula is given:—

| | |
|---|---|
| Nitrate of silver | 30 grains. |
| Water | 1 ounce. |

Also, the information that a stronger solution does not so much add sensibility to the film as it conduces to the rapid development of the image. Directions are also given to iodise the bath by immersing a collodionised plate for several hours. If the bath, from use, get slightly coloured, it is to be filtered; and if, after filtration, the colour or impurity still remain, it should be put away and be exposed to daylight, when, by standing for a few days, the whole of the dis-

coloration will be got rid of and be thrown down as a black precipitate. Mention is also made of using the plates with the film washed, and after washing flowing with pyrogallic acid solution.

For developing Archer has recommended gallic acid and acetic acid to be used as a bath; also gallic acid, sulphate of iron, sulphuric acid, and tartaric acid. Then pyrogallic acid and acetic acid and water to be used as required. The proto-nitrate of iron, made by mixing sulphate of iron and nitrate of baryta.

Further: a mixture for negatives of pyrogallic acid, protosulphate of iron, tartaric, citric, or acetic acids and water; also, pyrogallic, water, and formic acid. Fluoride of iron is spoken of in very high terms as being the most stable salt in solution.

For fixing, hyposulphite of soda and cyanide of potassium are both mentioned. W. T. Wilkinson.

## AUSTRALIAN REMINISCENCES.

East, north, and west were the heads of innumerable mountains, clothed with dark green or smoky-blue-foliaged trees, between them running the intersecting valleys, and cutting them up into immense hillocks rather than any continuous line of mountain. Away in the distance, to the north-west of us, stood Mount Lindsay, looking not greatly above us—although it must have been, for it is some 5,700 feet above sea level. With its perpendicular sides and slightly-domed top it looked like some immense casket. For years past many an ambitious youngster had looked up its bare side, and wished to get to the top and have an exploration thereof; but its towering height, and the absence of any means of holding on while ascending, rendered it seemingly impossible. The aborigines had a tradition that one of their countrymen had been on the top, and that there was a fine basin of water there; but that was a long time ago, and there were vines clinging to the face of the rock by which he ascended. The feat was accomplished twelve months or so since by two adventurous young men living on a neighbouring station; they, however, did not find the basin of water or anything to repay them for their trouble and risk, except the view from the elevation and the renown gained by their adventure "on a ladder of ropes" or some such contrivance.

Close to Mount Lindsay stands Mount Glennie, with a thorough Alpine look, so far as outline is concerned, running up to a point, which at our distance of fifty miles looked inaccessible, and, if otherwise, quite untenable. It is, in point of fact, really comparatively easy to reach its top, if hard climbing can be called easy under any circumstances.

From our eminence we tossed big boulders into the valley below. We could not see where they went, but could hear them, for some time after, crashing along through the timber. On the south side lay a great plain, miles in extent; along it ran a track rather darker than the rest, and on the track with a scarcely visible and snail-like motion wound a team of bullocks, looking no larger than a slug in a half-acre garden plot. Here and there, like threads of silver, were seen small streams of water crossing the great flat in various directions; the cattle were microscopic objects. In the distance was the inhospitable residence of old A——. Wealthy, pompous, greedy, and frigid in his manner, few were made welcome under his roof; and if perchance a traveller asked permission to sleep in an outhouse, he would require to find his own blanket. Absolute and unmitigated purse pride! And this mountain, these plains, with their thousands of cattle, were his—the land at a nominal rent—besides several others in other parts of the colony and Queensland. Alas! that wealth should accumulate or fall into such hands!

Looking away to the south-east we see the white iron roof of another squatter's homestead some twelve miles off. But it is time to think about descending, for we have a long ride after our clamber down; and so gathering some sticks and lighting a fire, in hopes of being able to see it after dark from the house of Mr. J——, we clamber down with as much, if not more, difficulty than we got up, my sister coming along bravely, declining any assistance, but suffering the loss of a pair of light boots, which gave way under such unexpected and unreasonable treatment. When we reached our horses we found them still tied to the tree where we left them, and a dog also awaiting us, who had tried to get to the summit, but, lacking *cur*rage—courage I mean—proved a *cur*, and returned, therefore, to wait. Slowly and steadily our good nags wound about along the ridges, and at length brought us to the plain. Two or three miles of a swift canter, and we were glad to get home, as the air was now feeling chilly. We were disappointed, however, for our fire was invisible, although the night was dark. It must have gone out or burnt away too quickly. A. L. E. X.

## FOREIGN NOTES AND NEWS.

Dr. Schnauss on Magic Photographs.—Herr Fritz Luckhardt's Borders for Oval Portraits.

A few months ago Dr. Julius Schnauss published some observations on the chemistry of the process by which "magic photographs" are produced. He then made a statement, on the authority of the most eminent photographic chemists, which further research leads him to consider erroneous, and he feels bound to make the contradiction public through the same channel as the previous assertion, which was that to sulphide of mercury the magic pictures owe their peculiarities. He has recently been engaged in a series of investigations of the properties of mercury and the silver salts, of the results of their action upon one another, and of the relation of mercury to bisulphate of soda. In the course of these investigations he ascertained that the addition of chloride of mercury to soda causes a precipitation of metallic quicksilver, and, further, that the magic photographs are easily dissolved in a warm solution of nitric acid; as, however, this solution only contains oxide of mercury, the photographs in no way consist of *sulphide* of mercury, but only of finely-powdered metallic quicksilver. This may sound quite paradoxical, but it is none the less based upon established facts. There only remains now to be discovered whether some mercuric suboxide is not also precipitated upon the paper. In this form it is difficult to separate Hg from $Hg_2O$, or even to distinguish between them. Since albumenised paper contains sulphur it is recommended that ordinary paper be employed for these magic pictures.

Herr Luckhardt is of opinion that portraits of ladies' heads should always be printed in an oval form, or else have an oval matt placed over them, in order to prevent the white border of the mount or the album in which they are placed from disturbing the general tone of the lights and shadows in the picture. To illustrate this theory he lately laid a collection of cabinet portraits before the Photographic Society of Vienna. Some of these pictures were surrounded by an oval line beyond which patterns had been printed by means of a second negative provided with an opaque oval centre corresponding in size with the oval of the portrait. Some of the patterns so printed were mere black and white reproductions of various marbled and fine-patterned chintzes and papers; others were ornaments and initials in the style of the old French engravings, and were reproduced from copperplates. In this last manner the initials and crest or armorial bearing of the person in the centre of the picture could easily be introduced; but the special preparation of the border would necessarily add considerably to the expense of getting up such a portrait. In order to place the pattern to be printed properly upon the negative it is advisable to employ a small table having attached to it, a little below the level of the table top, at an angle of 45°, a mirror to reflect the light, and above, as a plate table, a sheet of glass the underside of which should be previously coated with yellow collodion. When paper matts are employed all that is required is to gum them lightly at the edge in order to keep them in position.

We are inclined to agree with Herr Luckhardt in thinking that the mass of white that surrounds a photograph in an ordinary album does interfere with the tone of the lights and shadows, and that usually an oval is preferable to an oblong for heads; but we would suggest that these defects might be remedied by simpler means than those he proposes. Nowadays albums are made with an equal number of oval and oblong spaces, and if it were thought desirable they could easily be made without the oblongs; then might not the disturbance of tone caused by the mass of white or cream-coloured ground be rectified by the substitution of another ground colour, such as, for instance, one of the numerous shades of grey?

Not having seen any of Herr Luckhardt's borders we are, of course, unable to judge of their effect; but, from his description of them, we should think they resemble a style of mount introduced some years ago for *carte-de-visite* heads, which became pretty popular amongst second-rate photographers, but was not adopted, so far as we know, by any first-rate professionals, the latter preferring the severely simple style of mount which has nothing upon its face to distract the eye from the portrait. The mount of which Herr Luckhardt's edging reminds us had an oval about two inches in length and one and a-half inch in width, surrounded by some engraved scrolls, but the general effect was tawdry. We must not forget, however, that, if the engraved mounts were considered to be in bad taste, albums having elaborately-ornamented and fantastically-shaped spaces for pasting in photographic scraps are very fashionable just now, so that it would be difficult to say whether Herr Luckhardt's suggestion would take the popular fancy or not; but, owing to the trouble and expense attendant on the getting up of special borders, we should say the probability is that it will not be adopted.

# Meetings of Societies.

## WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting of this Society was held on Monday, the 3rd instant, at the Victoria Hotel, Bradford,—Mr. J. W. Gough, President, in the chair.

The minutes of the last meeting having been read and confirmed, Mr. G. Sutcliffe, Bradford, was elected a member.

There being no further business on the paper the question-box was opened, and the first question to hand—"How does the half-holiday affect the business of those photographers who now enjoy it?"—was laid before the meeting for discussion.

The Chairman remarked that as the Bradford photographers had tried the experiment the meeting would doubtless be glad to hear the result of the trial.

Mr. Rushforth stated that so far from the practice deteriorating his business he believed it to be a decided advantage. He himself invariably closed and went into the country, returning to his work the next day with greater zest, and he believed he had not lost any customers by it, as they all came on some other occasion.

Mr. Gunstone said they had found it to work satisfactorily, and were not aware of the slightest diminution of business. He would be extremely sorry were the half-holiday discontinued.

Mr. Thompson also spoke in favour of the movement.

Mr. Wormald was of opinion that, if the holiday were granted, the operators thus benefited should make up the time on another occasion, though the average number of hours worked in a week should be taken into consideration. If a man came at ten and gave up work at four he could not see the necessity for the holiday in such a case.

Mr. Broadhead fully recognised the necessity for the weekly half-holiday, and said that, although it was not a custom in Leeds, he had found it to his advantage to give each of his assistants a half-day weekly, though he did not close his place of business, but allowed each of the assistants the vacation on a different day. If, however, the Leeds photographers should arrange to close their respective places of business on one particular day he would gladly coincide with the arrangement.

Mr. Holgate (referring to a remark of Mr. Wormald's) said that an out-door operator did not require the holiday so urgently as the indoor workman. For the man spending the greater part of his time amongst the deleterious vapours of the dark room a little fresh air and recreation became a prime necessity. For his own part he should like to advocate closing for the whole day, as with most photographers comparatively little business was done except preparing for the afternoon's work, and a half-day was too short a time to go any distance. He should very much like to see the holiday an accomplished fact among the profession.

Mr. Wormald considered it was not necessary for a man to travel a great distance to enjoy a holiday or derive benefit from it. If a man had a garden and would dig in it an hour or two it would do him as much good as a long excursion.

The Secretary, on behalf of an establishment with which he had been connected, said the system had proved highly successful. Patrons had often come in just at closing time, but when the matter was properly represented to them, they cheerfully acquiesced in the request to come another time.

Mr. Batho entirely approved of the movement, quoting the saying—"All work and no play makes Jack a dull boy." If they wished a man to produce good work the holiday would have a decidedly beneficial effect, as there could be no doubt that if a man were overworked the quality of his work would proportionately deteriorate. If all photographers would combine, and unanimously decide to close their respective places of business on a given day, the matter would be easily managed; and when the public became aware of the custom they would accede to it.

Mr. Holgate suggested the advisability, as far as possible, of photographers avoiding having their holiday on the days when other trades had theirs, so as to afford the assistants on their holiday an opportunity of visiting the photographer's studio.

The Chairman suggested that as the meeting appeared to be unanimously in favour of the movement being set on foot, it might be advisable to appoint a committee for each town represented by the Society, such committee to consist of a principal and an operator, who should call upon the other members of the profession and solicit their concurrence.

The Secretary said the movement in Bradford had been carried out in a similar manner. A member of one of the leading firms in the town called upon two or three of the other photographers to ascertain their opinion on the matter, and they all being in favour of the movement formed themselves into a committee, and called on the various other members of the profession requesting their co-operation, and the scheme met with so much approval that there was not to his (the Secretary's) knowledge one dissentient voice.

Seeing the question could not be definitely settled it was resolved, on the motion of Mr. Bulmer, seconded by Mr. Batho, that the discussion should be postponed, several of the members promising to see the others who were not present, and ascertain their opinion on the matter.

The next question taken from the box was—"Has any member tried bichromated glue for lining a bath?"

The Chairman said that, chrome alum not being readily obtainable, he had used ordinary alum, and found the dish perfectly waterproof, but the bath solution was much disorganised.

A Member said he had used a bath lined with wax dissolved in benzole, but had found it too brittle, as it left the dish in small flakes.

Mr. Bulmer suggested that a little india-rubber dissolved along with it would have a tendency to make it less brittle.

The Chairman had tried the last-mentioned method. He found the rubber solution did not spread evenly, but rose up in small lumps.

Mr. Wormald said the best composition he had been able to find for the purpose was shellac dissolved in methylated spirit. When dry it absolutely repelled the solution. His method of using it was to have dishes made of cedar, which, owing to its lightness, he preferred to any other wood. He warmed them, coated them well with solid paraffine until the wood had absorbed a considerable quantity, and then gave them two or three coats of shellac. He had followed that plan for some time and found it every way satisfactory.

Mr. Batho inquired if Mr. Wormald had found the bath solution to have any effect upon the shellac. He thought the ether contained in it might exercise some solvent action.

Mr. Wormald had not found any deleterious effect arising from any such action. In his opinion the quantity was so small as to have no effect.

After some further desultory conversation,

Mr. Rogerson inquired if any member had had any experience in toning transparencies with platinum or iridium salts. He had experimented with them both before and after fixing, each method giving very different results; but he had not been able to secure the fine brown tones seen in some of the commercial slides.

Mr. Batho said the platinic chloride should be neutralised with carbonate of soda, as the presence of hydrochloric acid prevented the toning action.

No other subject being brought forward it was decided, on the motion of Mr. Holgate, that the Society should hold its first out-door meeting, in Bolton Woods, on the 26th inst., and the meeting was adjourned.

# Correspondence.

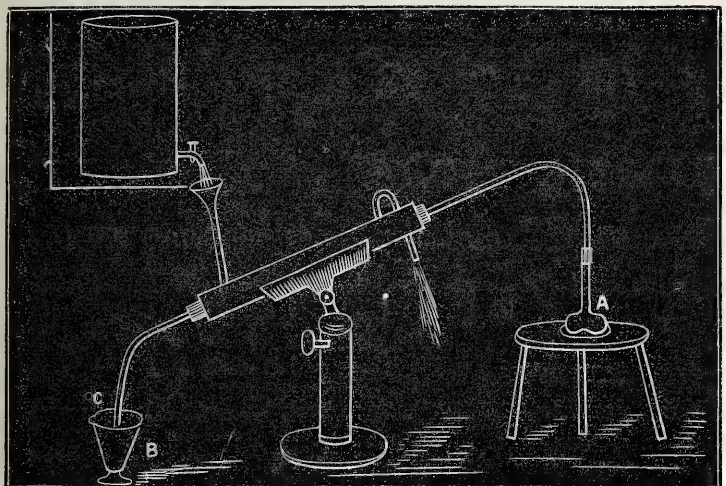
On the Adulteration of Alcohol with Methylated Spirit: Means to Detect the Fraud, by Messrs. Rich and Bardy.—The French Alpine Club: Adoption of Photography to Illustrate the Description of their Travels, Voyages, &c.

For the last few years the high price of alcohol or spirits of wine has caused adulteration to be carried on to a large extent, wood naphtha being generally employed for that purpose. The latter product is well known by its disagreeable smell, from which odour it was thought impossible to purify it. Human ingenuity at length, however, succeeded in rectifying it, and large fortunes have been made at the expense of the revenue department and the public, alcohol paying about 3s. 4d. per quart duty, whereas, when methylated, it pays about 9d. The mixture was supposed not to be potable, and only fit to make varnish; it therefore escaped the high excise duties levied on vinous alcohol.

When the government heard that methylated alcohol was sold and drunk several able chemists were employed to discover an easy means of detecting the adulteration. MM. Rich and Bardy, the well-known chemists, imagined that the problem could be solved by means of the different shades and stability of colour which the ethylaniline and the methylaniline take in their oxidation.

In order to analyse alcohol supposed to contain wood spirit MM. Rich and Bardy give the following formula:—Ere you begin to work prepare the distilling apparatus (see diagram), as the distillation commences immediately the chemicals are introduced into the glass bulb. Pour into the glass bulb A 10 cc, = 154·346 grains, of the alcohol to be analysed, and add 15 grammes, = 231·519 grains, of iodine, and 2 grammes, = 30·8692 grains, of red phosphorus. The distillation will begin immediately without the aid of heat. The product of the distillation must be received into the glass B, which should contain about 600 grains of distilled water. The end of the glass tube C must be plunged below the surface of the water. When the distillation is completed the alcoholic iodide is separated from the water and put into a glass bulb containing 6 cc, = 92·6076 grains, of aniline. The mixture becomes heated, and the reaction can be pushed on by holding the bulb for a few seconds in

warm water. If the ebullition be too rapid it must be moderated by dipping the bulb into cold water. The reaction must be continued for about an hour, after which hot water is poured into the glass bulb to dissolve the crystals. The glass bulb is then put over a Bunsen burner and the liquid kept at the boiling point for a few minutes, until it becomes clear.




An alkaline solution is now poured into the bulb which sets at liberty the alkaloids in the shape of an oil which, on the addition of a little water, can be drawn up into the neck of the glass bulb, which facilitates its extraction when required.

Mix together—

| | | | |
|---|---|---|---|
| 100 grammes, | = 1,543·46 grains, | of sand (quartz). |
| 2 ,, | = 30·86 ,, | of chloride of sodium. |
| 3 ,, | = 46·30 ,, | of nitrate of copper. |

Take ten grammes (154·346 grains) of this mixture and one gramme, = 15·4346 grains, of the oil produced; mix thoroughly and place in a seven-eighths of an inch fluted glass tube. This mixture must be kept for about ten hours at a temperature of 194° Fahr. Take 100 grammes, = 1,543·46 grains, of warm alcohol, and with it dissolve out all that is soluble of the mixture in the glass tube. If the alcohol take a reddish colour it is a proof that it is pure vinous alcohol; if it present a violet tinge it contains wood spirit. The violet colour is denser according to the quantity of wood spirit employed in the adulteration.

MM. Rich and Bardy, in order to judge immediately of the quantity of wood spirit employed in the methylated alcohol, take a certain number of fluted glass tubes—say three-eighths of an inch in diameter. These tubes are numbered from one to ten. No. 1 is filled with pure alcohol having the reddish tint; No. 2 with alcohol methylated at one per cent., this bearing a slight violet colour; No. 3, alcohol methylated at two per cent.; No. 4, the same at three per cent.; No. 5, the same at four per cent., and so on. When a sample is analysed it is put into a tube of the same form and size, and placed in front of the range of type tubes. If its colour coincide with tube No. 4 it contains three per cent. of wood spirit.

Adulteration of alcohol is so prevalent in Paris that M. Bardy told me he was obliged to distil his own alcohol from a cask of his own wine in order to be sure of his type (No. 1).

MM. Rich and Bardy have rendered great service to photographers in giving them a means of detecting the adulteration of their alcohol, as not only are they robbed by the merchant—who sells them methylated alcohol instead of vinous alcohol—but their silver baths soon become contaminated with organic impurities.

The foundation of the French Alpine Club is of very recent date; it was originated in the year 1874. Although younger than its sister society on the other side of the channel, it gives proof of great vitality. At the first meeting on April 2, 1874, M. de Billy, Inspector-General of Mines (although absent), was unanimously elected President. Alas! this gentleman never was aware of his election, for on the 4th of April he was killed in a railway accident, near Dijon, when on his way to Paris. His sudden death proved a severe loss to the new Society, and he was deeply regretted by the members, as he was one of the most devoted and energetic of the founders.

At the next meeting M. Céranne, Député des Hautes Alpes, was elected President. Although the Society began under such sad auspices it has not ceased to be prosperous, numbering at the present time more than 500 members, and embracing several branch societies. It also publishes a periodical journal.

Since the formation of the Club its members have not only visited the Alps, the Pyrenees, the Vosges, but two of its members, MM. Ch. Petit and Labouret, explored the environs of the North Cape. On their return the members furnish an account of their travels.

M. Ch. Petit made photographic views on dry plates, to illustrate his voyage. Alas! few of the other members were able to do so, being ignorant of our art. I can, however, mention an exception—M. Montefiore—who has done all he can to instil into the minds of the members the immense advantages that photography offers to its adepts. By indomitable perseverance his efforts were crowned with success, and the French Alpine Club now counts among its members numbers of photographic amateurs, and the time is not far distant when each member will consider it his duty as well as his pleasure to carry with him in his excursions his camera and dark slides garnished with dry plates.

All honour be to those energetic men who are not contented to receive instruction and amusement themselves, but are generous enough to impart to others the knowledge they possess—to show to others the springs from which they derive their pleasure, at once stimulating the idle by their example, pursuading the undecided by their conversation, and exciting emulation in others by their own success!

M. Montefiore is a gentleman whom nothing daunts, *ayant le feu sacré*, and who, successful himself, has been able to popularise a love for photographic manipulations. A short time ago this gentleman gave a lecture before the Club on photographic appliances, from which I extract the following:—

"The sweet remembrance we have of our excursions is a continual and inexhaustible spring, from which we can for the remainder of our lives derive pleasure. How much more vigorous would be the impression in our memories could we see before us the true design of those magnificent landscapes which interested us so much! Before the invention of photography it was the privilege of only a small number to be able to sketch rapidly on paper the imperfect design of a landscape or the complicated silhouette of the mountains. A little later the daguerreotype and photography came to the aid of a few experimental manipulators, but the *impedimenta* required was too cumbrous. At the present day, by the progress achieved we can at very little expense take with us, for the purposes of landscape photography, the necessary apparatus, at once light and easy to put into working order, with dry plates prepared beforehand, and one or two bottles containing harmless ingredients for the development of the negatives—all which manipulations are easily learned."

M. Montefiore then gave his advice as to the apparatus which would be the best and the least cumbrous to take up the mountains. He thought that, for many, dry plates $3\frac{1}{4} \times 4\frac{3}{4}$ would be sufficiently large, and he laid before the members many proofs taken from negatives of that size. He then described how easy it would be to obtain glass transparencies for projection by the aid of the magic lantern, and informed his hearers how interesting it would be at their winter meetings to make lantern projections of the landscapes described, which would considerably heighten the interest of the lecture by transporting us, as it were, to the very place of which they were speaking. M. Montefiore offered to the Club two very pretty cameras, which he had had constructed for the purpose, which apparatus, he said, could be made use of by any of the members, who were, in return, to permit the Club to have the free use of the negatives. The dry plates of Professor Stebbing, he further said, could be easily obtained from any of the dealers in chemical appliances for photography, and could be developed either by the alkaline or by the acid pyro. and silver salts. M. Montefiore developed a *cliché* before the members, which interested them very much; and, in order to add persuasion to teaching, he continued:—

"If any among you desire to learn photographic manipulations I should be most happy to teach them in a practical manner, and we will make short excursions into the environs in order to take views. I should be most happy to show how easy photography is in practice; and if I could inspire all present with the desire to take a small apparatus with them when they travel I should be well repaid, for very soon our Club would possess a collection of original documents which would be of inestimable value."

Let us hope that the example given by M. Montefiore will be followed; then the oft-repeated complaint that "amateurs are getting scarcer and scarcer every day" will be heard no more. And whenever a member of the English Club, in visiting the radiant summit of the Alps, meets with a gentleman in the act of photographing the landscape, let him give the other a fraternal shake of the hand in wishing success to the French Alpine Club. E. Stebbing, *Prof.*

3, *Place Bréda, Paris, May* 25, 1875.

## IODIDE AND BROMIDE OF SILVER.

*To the* Editors.

Gentlemen,—Attention does not seem to have been called to a curious circumstance connected with Mr. M. Carey Lea's discovery of the increased sensitiveness of bromide of silver when combined with a small amount of iodide of silver, viz., how this fact, which seems at your hands and those of Mr. Cooper's to have been amply verified, corresponds exactly to a similar state of things in connection with iodide of silver. There is certainly no science where there are so many *apparent* contradictions as in photography; and the circumstance I allude to is a curious example of one of these contradictions, which has a double application.

A film containing only iodiode of silver is more sensitive than a bromide of silver film, both being developed with iron; yet, contrary to what would be expected, an iodide of silver film containing a *small* amount of bromide of silver is *more* sensitive than the plain iodised film!

Now, we find in Mr. Lea's process an exactly corresponding state of things in connection with a bromised film, viz., a bromide of silver film with an alkaline developer is more rapid than an iodide of silver film with the same developer; and yet, as in the former instance, an *increase* of rapidity is obtained by adding a small quantity of the *less* rapid silver salt to the more rapid one!

I am not chemist enough to attempt an explanation of the above, but hope it may, perhaps, be useful to draw attention to the fact, though, doubtless, it has struck others as well as myself.—I am, yours, &c., George Mansfield.

*Morristown Lattin, Naas, Ireland,*
*May* 22, 1875.

## EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale,* that being done at the small cost of one shilling in our advertising pages. This column is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

Wanted to exchange a *carte* lens, by Vallantin, for a pair of six-inch focus single view lenses by any good maker.—Address, R. C., 25, Williamson-street, Liverpool.

A No. 2B Dallmeyer lens will be exchanged for a 6 × 5 Dallmeyer's rapid rectilinear lens (patent) and cash, or offers.—Address, T. C., 106, St. Mary-street, Weymouth.

I have a 10 × 8 Ross's view lens and a French cabinet lens. Will take in exchange a pair of stereoscopic lenses, Ross's or Dallmeyer's, or a 10 × 8 bellows camera.—Address, C. Rawlinson, photographer, Preston New-road, Blackburn.

A four-cell bichromate battery (carbons 5 × 3), a medical coil, and three volumes of *Cassell's Technical Educator*, bound in one, all in good condition, offered for a good quarter-plate portable camera.—Address, T. Chapman, 21, Paddington-street, London, W.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

Colonel Wortley.—Received.

S. Simon.—The perspective is true, but the taste is bad.

J. W. Price.—The letter has been forwarded to the writer of the article.

A. B.—All that is required is to arrange your blinds better than at present.

B. W.—The deposit in the gold solution is caused by a too liberal addition of carbonate of soda. Add a little hydrochloric acid.

X. X.—You cannot obtain a copyright in the picture. By entering it at Stationers' Hall you would not be aided in any way.

The Acid Bath.—Received from Mr. W. J. Stillman specimens, by Mr. Black, of Boston, taken by his acid bath. More of this again.

Parisian.—1. We shall be glad to receive a further account of the phenomena. —2. The author of the book misapprehends our position in the matter on which he treats.

Cyanide.—The gentleman about whom the interpellation is made is alive and well, and is the writer of this "answer." Thanks for inquiries and complimentary remarks.

Humber.—The combination printing-frames were at one time the subject of a patent, but the patent no longer exists; hence you are at liberty to make and use them to any extent you may desire.

H. L.—Some observations on photo-electric engraving will be found in the first number of our volume for 1869. You will also find details of another process of a similar kind at page 506 of the volume for 1871.

Amateur (Bradford).—The plates will keep for several months after exposure, and will still develope into good negatives. From personal experience we can assert that they will remain good for five and a-half months.

P. F. G. D.—The increased energy of the development is owing to the temperature being now much higher than when we gave you the formula. You may safely dilute it by the addition of a third of its bulk of water.

B. J. Harding.—All letters for the "Peripatetic Photographer" must be addressed to the care of the Editors or Publisher of this Journal. We never publish the name or address of any correspondent or contributor who desires to remain *incognito.*

Lionel.—The error is a clerical one. A highly-bromised collodion was also tried, but we considered it better to confine our publication of the detailed account of the experiments to such as were made by means of collodion in everyday use.

J. G. Gilchrist.—The object-glass of your telescope may be all that you assert and yet be worthless when used as a landscape lens. The kind of correction required in a telescopic objective is quite different from that required in one for photographic purposes.

S. S. C.—To secure photographs of ships in motion retire from them as far as possible, and use a portrait lens with an aperture sufficiently large to enable you to get full details with an exposure of from a twelfth to a twentieth part of a second. If you manage this you will succeed in your aims.

H. Cockburn.—Palladium is exceedingly infusible, but, like platinum, it may be melted by the oxyhydrogen blow-pipe. It forms with cyanogen—for which it has a very strong affinity—a series of double cyanides. A rather small proportion of this metal mixed with gold renders it very white.

A. B. C.—To destroy the greasiness of albumenised paper so as to make water colours "bite" all that is necessary is to moisten it with the tongue. "Preparation liquids" are also sold by artists' colourmen. A formula for the preparation of ox-gall will be found in the previous number of this Journal.

Edward S. Warren.—To acidify the bath to such an extent showed carelessness; but the nitric acid may easily be eliminated by adding oxide of silver until a piece of blue litmus paper ceases to become red. Carbonate of silver will also answer the same purpose; or even carbonate of soda may be added, if the presence of the nitrate of soda which will be formed be not considered objectionable.

J. Cooper writes—"From the careless manner in which photographs are handled by the general public I thought the note on the back of the enclosed mount would prove of use. If you think it worth notice in the Journal it is at your service."—The note referred to is printed on the back of the mount, and is as follows:—"If you value this photograph handle it as seldom as possible, and preserve carefully from damp."

Somebody.—Some waggish friend has been fooling you and taking advantage of your ignorance. Nectar is not a chemical at all, but a term applied in Grecian mythology to the supposed drink of the gods. What are we to think of the success attending the schoolmaster's mission in the year 1875 when we find that "Somebody" has been so simple as to purchase a formula for a secret process of rendering silver prints indestructible, in which formula "nectar" forms one of the ingredients, and "dento-chloride of caloric" another?

Quiz.—You have misunderstood the article. We did not say that the lens could be made to "fib." We have certainly said, and here again repeat, that it is not only possible, but quite easy, to take a photograph of certain objects which shall be absolutely true to nature in respect of drawing, but which, notwithstanding, shall yet convey to a person examining the pictnre a totally false idea of the objects photographed. However, this is not true of photography alone; it equally applies to the work of any or every artist who makes his drawings from an improper point of sight.

Alpha.—Our correspondent suggests the desirableness of publishing a directory containing the names and addresses of every photographer in Great Britain and Ireland, and is of opinion that such a compilation would prove very useful. Doubtless it would to a few; but who would pay for the enormous labour and expense involved in compiling such a directory if to be trustworthy? The only persons likely to be benefited by it would be the photographic dealers, and they are so few in number that, in order to prevent the compiler and publisher from sustaining a loss, each copy of the book would require to be sold for many pounds.

Rev. C. Bruce.—In your case the stains on the tannin plate are, doubtless, caused by not giving the plate a sufficient amount of washing before applying the preservative. The following experiment will prove both interesting and useful:—After removing the plate from the silver bath wash it all slightly, then wash one half only very thoroughly, using at first water containing a little chloride of soda, afterwards rinsing with plain water. By this means the whole of the free nitrate of silver will be removed from one half of the plate only. Now apply the tannin (a fifteen-grain solution) and observe the red stain on the imperfectly-washed portion. Dry the plate, then expose and develope, and notice the effect of proper washing of the plate.

R. S. G.—We are not aware by what means the "alba" plates imported from America are prepared; we only know that they are very beautiful, and answer admirably the purpose intended. Being recently in want of a few in order to try some experiments in carbon printing upon them, and having no means of obtaining them readily, we set to work and experimented in the manufacture or preparation of a few, and eventually succeeded beyond our most sanguine expectations. One little carbon print we have produced upon an "alba" plate of our own manufacture is so beautiful as to lead us to hope that this application of carbon printing will be largely adopted. The American plates are doubtless a little expensive at present; but when the demand becomes greater the price will probably be reduced.

## CONTENTS.

THE BRITISH

# JOURNAL OF PHOTOGRAPHY.

No. 787. Vol. XXII.—JUNE 4, 1875.

## THE NEW PLATINUM PRINTING PROCESS.

We had last year the pleasure of being enabled to describe an entirely new method of positive printing discovered, or, rather, "invented," by Mr. William Willis, jun. That process, we then stated, was based upon certain discoveries he had made in connection with modes of reducing platinum, iridium, and other metals; and in our last Almanac we gave a succinct description of the characteristic features of the process in the following remarks, which we quote by way of text for what is to follow:—

"Starting with the view of making photographs in the most stable metals he could think of, Mr. Willis sought to find a good reducer of these metals, and spent some time in making experiments with ferrous oxalate—a beautiful lemon-yellow powder known to be insoluble in water and most other menstrua. Working away for a considerable time without any satisfactory result, Mr. Willis eventually discovered that a solution of it in the neutral oxalate of potash instantly precipitated the metal from the ordinary chloride of platinum; in other words, he found that a solution of ferrous oxalate in potassic oxalate reduced salts of platinum to the metallic condition. Now, as fer*rous* oxalate can be produced by the action of light upon fer*ric* oxalate, it follows that if the paper, which has received a wash of chloride of platinum and ferric oxalate, be exposed in the printing-frame and then receive a wash of potassic oxalate the metal will be reduced in proportion to the action of light."

Having thus presented the *rationalè* of the process somewhat in contour we now direct attention to the process as carried out in actual practice. Although we had previously seen a number of specimens produced by Mr. Willis, and had tried a few experiments which satisfied us as to the reactions which took place and of the permanence of the prints produced by this means, yet until a few days ago we had never seen the process practically worked. Of these practical operations we have now been a witness, and shall give a statement of the *modus operandi* which cannot fail to interest our readers.

Plain paper sized with starch is preferred—certainly that was the kind used on the occasion of our visit. It had previously been floated for two or three seconds, or for a sufficient length of time to wet the surface, on a three-grain solution of nitrate of silver, the object of which we will afterwards explain; for, unlike the usual printing process, *this* does not require any silver to aid in the formation of the image. Mr. Willis estimates that in each sheet of paper thus silvered there will be about one and a-quarter grain only of the argentic salt.

The paper was sensitised in a very simple and rapid manner, and one thoroughly efficacious, as was proved by the pictures afterwards produced. A large plate of glass, the size of the sheet, was placed in a level position on a stand, and the paper to be operated upon was laid upon this plate and retained in its place by a clip at each corner. A small quantity of a mixture of ferric oxalate and chloro-platinite of potassium was now poured on the centre of the sheet, and distributed over the surface by means of a pad of cotton-wool, being finally smoothed, so to speak, by a squeegee faced with felt or some soft fabric of a similar description. The whole of this operation, as may readily be conceived, occupied far less time to effect than it takes to describe. The paper was then immediately removed from the glass slab and placed upon a frame in the vicinity to dry—an operation which, as there was a stove in the room, occupied but a brief space of time. In the meantime another sheet was being coated in the same manner and passed off to the drying-frame, its place being supplied by a third sheet, and so on. The operation described is all the preparation the paper receives. It is now very sensitive, and ready for exposure in the printing-frame.

The exposure was effected in an ingenious manner. A number of printing-frames, each containing a negative and sheet of the sensitive paper, were arranged, face upwards, upon a kind of table or platform of about ten or twelve feet long by four or five feet wide. This table was inside of the house, and was borne by legs having wheels, standing upon two rails which passed outside through a wide doorway and on to the end of a yard, where was erected a house which is to have a translucent roof so as to enable printing to be carried on irrespective of the character of the weather and light. The table thus loaded was run out into the yard and the frames exposed during a period of time that we estimated at a fifth part of what would have been required to produce a print on ordinary albumenised silvered paper. Owing to the short exposure required the operator never left the frames at all, but stood by watching an actinometer placed on the table, the latter being then run back into the house, when, the doors being closed to exclude strong white light, the pictures were removed from the frames. They were all feebly, yet distinctly, visible, although up to this stage the platinum had not taken any part in the performance. The visible picture is composed of ferrous oxalate, and would have been visible had the paper been prepared with ferric oxalate without any platinum.

The treatment to which the print is next subjected is most interesting. Previous to commencing operations a solution of potassic oxalate, contained in a large, flat, porcelain vessel, had been prepared by the decomposition of carbonate of potash and oxalic acid, and this had been rendered slightly warm. In this the pictures were immersed—or, to speak more correctly, were drawn over its surface—the contact with this liquid instantaneously producing a strong, rich picture of a warm, velvety-black tone.

So far as mere permanence is concerned the print is finished at this stage, and might be treated with a solution of nitric acid without being affected by it; but it is subjected to some further operations with the view of rendering it more perfect. The first of these is placing the prints in a very weak solution of oxalic acid, which immediately dissolves out the ferric oxalate with which the paper was sensitised, and thus leaves the whites of the picture very pure and white. This is followed by rinsing in plain water.

As for many purposes the tones of the platina image may be considered cold, the tints are modified by placing the prints in a sulphocyanide gold toning bath to replace what little silver there may be in the image by gold; and, after a transference to a bath of hyposulphite of soda to remove the soluble platina and silver salts, the pictures are finally rinsed in plain water.

The foregoing describes the whole process of printing as we saw it carried out. The tones of the pictures thus produced are most excellent, and the latter possess a charm and brilliancy we have never seen in a silver print upon plain paper, added to which they are so permanent as to resist all the usual destructive tests. Of course

nitro-hydrochloric acid, or *aqua regia*, being a solvent of platina, must not be included among such tests.

Having described the practice, we now conclude with a few observations on the chemical phase of Mr. Willis's admirable process.

We have said that there is an infinitesimal portion of nitrate of silver applied to the sheet previous to commencing the ordinary operation of printing. One reason for its use lies in the means it affords of obtaining, by substitution of gold (in the manner above described), prints of a warmer tone than would be given by platinum alone. Another reason is one of a somewhat mechanical rather than of a purely chemical description. It acts, by its presence, in causing a more delicate deposition of the platinum on the finer gradations of the image, or, rather, it enables the fine deposit forming the delicate demi-tints of the lights to become more intimately attached to the surface of the paper than otherwise might be the case. The exact way in which it thus acts is not, at least by us, clearly understood at the moment we write this article, hence we will designate it, *pro tem.*, as a semi-catalytic one, and speak further concerning the part it plays when we are enabled to do so by the light gained by more experience. The term "*catalysis*" (acting by its presence) now and then proves very useful, although the principle underlying its employment is not to be commended for its soundness. It is, so far as we are aware, but a neat and scientific way of saying that one does not know the exact way in which a certain thing acts. So we, too, in connection with the precise action of silver as a means of preventing the agglomeration of the atoms of platinum at one part more than another, prefer for the moment to utilise the term "catalysis" in this sense. Will Mr. Willis make the matter clearer?

We now come to the action of the potassic oxalate. We have stated that scarcely had the papers from the printing-frames been brought into contact with the solution of this compound than out sprung the picture almost instantaneously. Now it is an axiom, or, at least, something akin to one, that no chemical action can take place unless one of the substances be in a liquid form. In these pictures, when they are removed from the printing-frame, the two substances—namely, the ferrous oxalate and the chloro-platinite of potassium—are both solid, and hence the former body has not an opportunity of acting upon the latter; both are side by side, being thus found in the most favourable position for one to pounce upon the latter, but it is "muzzled," and held in check. The question now arises—What will release it, so that it may reduce the platinum so conveniently situated for this purpose? We have already said that it is not soluble in water; the only practicable, or, at anyrate, the most feasible, solvent is the solution of potassic oxalate. No sooner is the picture placed in contact with such a fluid than the exposed parts—consisting, as we have said, of ferrous oxalate—are liquefied, and instantaneously exert their reducing action on the neighbouring particles of platinum.

From the above it will be seen that, while there is much beauty in the artistic results of the process, there is also undoubted value in the scientific principles which underlie its practice.

## EXPERIMENTS WITH IRON DEVELOPING SOLUTIONS.

Since the first introduction of iron developing solutions as a substitute for pyrogallic acid in the development of collodion pictures innumerable modifications have been suggested as improvements upon the simple solution of the protosulphate acidified with acetic acid. The objects held in view by different experimentalists have been various, the principal ones being greater rapidity and the production of printing density in one operation without the trouble of redevelopment.

Under the former heading may be mentioned the substitution of formic for acetic acid, while a very rapid developer, employed with success some years ago, consisted of the replacement of a portion of the acid by a certain quantity of loaf sugar. The ferro-gelatine developer introduced by Mr. M. Carey Lea, and various modifications of it recommended on account of their greater ease in preparation, come under the second category. Besides these, various chemical substances have been used in combination with the iron salt—notably, sulphate and nitrate of copper, acetate of soda, and many forms of organic matter; but the protosulphate, or the double sulphate of iron and ammonia simply restrained with acetic acid, appears still to retain the preference.

Recently the continental journals published a method of forming a developer capable of reducing the exposure in the camera to a mere fraction of the time required with the solutions in ordinary use, consisting in the substitution of methylic for ethylic alcohol. The results said to be produced were so great, and the means employed so simple, that numerous experimentalists immediately put the new developer upon its trial, but, sad to say, with an entirely negative result.

Some months ago a sub-committee, consisting of MM. Rottier and Waldack, was appointed by the Grand Section of the Belgium Photographic Association to conduct a series of experiments for the purpose of thoroughly studying the action of iron developing solutions under varying circumstances. These gentlemen, some weeks ago, communicated to the section the conclusions at which they had arrived, a summary of which will be found in our *Foreign Notes and News* at page 226 of the present volume. The results there given differed so materially in some respects from what we had previously held to be the case that we were induced to repeat the experiments for our own satisfaction, and now purpose giving the results.

We may here state that, unlike the Grand Committee, we confined our experiments to solutions acidified with acetic or other acid, believing that no results of any value, nor lessons of practical utility, can be obtained from solutions containing no restraining agent. Our experiments were made, of course, with wet plates, the bath being a new one of thirty-five grains to the ounce, rendered slightly acid with nitric acid—a standard developing solution of protosulphate of iron fifteen grains, acetic acid fifteen minims, water one ounce, being used, when necessary, for purposes of comparison.

The first point which engaged attention was the strength of the solution of iron. This varied from five grains to thirty in each ounce of developer, the quantity of acid employed ranging from two-thirds to twice the quantity of the iron salt. The conclusions we arrived at in this branch of the question were quite at variance with the results obtained by MM. Rottier and Waldack. These gentlemen state that the density of the image increases with the strength of the solution; that the physical nature of the deposit also varies according to the strength, the effect produced by a weak solution being thin and transparent, which they attribute to the *extreme fineness* of the particles of silver deposited. This appears to us a rather unexpected conclusion, we having been under the impression previously that the great *density* obtainable with pyrogallic development arose from the same cause—the fineness of the deposit—and that the thin iron-developed images consisted of larger particles loosely packed together. Practically we found that the effect produced was rather the reverse, but that the quantity of acid contained in the solution exercised a marked effect upon the nature of the deposit. We may sum up by saying that the slower the development, whether from the use of a weak solution or the presence of a large quantity of acid, the denser the image; while, under reverse conditions, a greater amount of detail, with increased softness, was noticeable. The colour, we concluded, depends as much upon the length of the exposure as upon the strength of the solution. It is but just to say that the results reported by our Belgian *confrères* were obtained with *plain* iron solutions, which may possibly account for the difference.

We next turn to the acids employed as restrainers. The first point of difference we have to mention is with regard to the organic acids. The report states that the organic acids in general produce images of a black metallic nature, acetic acid (which, by the way, is the only organic acid mentioned) being an exception. Citric acid, as all know, *has* a tendency to cause a black or bluish colour in the deposit, but it is the only one we found which did so. Formic and tartaric acids—especially the latter—we found to give images of a beautifully white colour, by reflected light, very suitable for glass positives, in the former case a slight tinge of pink being noticeable. By transmitted light the colour was scarcely distinguishable from that obtained with acetic acid. Of the mineral acids nitric and sulphuric were the only two we considered it worth while to test,

their chief characteristic being the brilliantly metallic appearance when viewed by reflected light. An opinion is expressed that the greater the quantity of acid employed and the slower the image appears the thinner it will be—an opinion which it will be seen by reference to what we have already said is totally at variance with our own. We agree, however, in believing that a longer exposure is necessary to produce the same amount of detail with a large quantity of acid as is obtained with a quicker development.

Of the different salts and combinations of salts employed by MM. Rottier and Waldack we find, with the exception of the acetate, that none differ materially in our hands from what is said of them in the report. The acetate, however, which is there placed at the head of the list as regards value, we find to be greatly inferior to all, with the exception of the nitrate. The double sulphate of iron and ammonia we have long known to require a less exposure than the sulphate alone, but for general purposes we prefer the latter.

We have had numerous inquiries as to whether iron development is feasible in connection with dry plates, and, though in view of the convenience and rapidity attained by the alkaline method we fail to see any probable gain in the use of iron, we know there are many persons who would much prefer to employ it if equal results could be produced by its means. It was partly with a view of testing this question that we undertook our experiments, and we may at some future time give the result of our experience in this direction.

## PORTRAITURE.

It is an oft-repeated saying that, probably, no branch of science or art, in its commercial and social aspects, in the magnitude of the commercial transactions to which it has given rise, and the influence which it has exercised over the social and domestic relations of life, has made during the first quarter of a century of its existence such astonishingly rapid strides as the practice of photography. Ushered into the world apparently at the fitting time, and within a few supervening years published in a form so simple and certain that but little practical experience was required to produce good results, and upon which, as has been frequently shown in our columns, very little alteration has been made even up to the present day, it rapidly drew within its charmed circle men of all trades and professions, while its influence extended to every part of the world in which any approach to civilisation had gained a footing. That some—probably a great deal—of this popularity was due to the charms of landscape photography we do not doubt. To amateurs—especially to those whose lot is cast in large cities, and who having an occasional leisure day find, as all whose brain or muscle is severely taxed do find, that rest in the shape of change of occupation is absolutely necessary—landscape photography is felt to be the very thing required. It takes them to the ozonised atmosphere of the seaside, and taxes to the utmost their highest intellectual power to catch the breaking wave, the passing ship, and the occasional glorious combination of cloud and sky so difficult of reproduction and so charming when obtained; to the wooded dell, where stands the ruin of some ancient building, which tells its own story of bygone days, and close by which runs the rippling stream, or larger river, which not only makes music to the ear as it glides along its pebbly bed, but also imparts to the mind an example of perseverance and determination, as it pushes on, despite of all obstacles, on its onward journey to the sea; or to the ever-bracing air of the mountains, where food for both camera and mind is ever to be found in grateful abundance, and where, better perhaps than anywhere else, the enervating influences of city life are most effectually counteracted. Nor is this all: the pleasure of landscape photography is not confined to the amateur himself, nor to the one day on which the pictures are taken. His pleasure is renewed on every occasion when he exhibits his pictorial treasures to his friends, while, when he can afford it—and in many cases even when he cannot well do so—very much adds to the mutual pleasure of those friends by presenting them with copies of the pictures they admire.

Although, however, we believe that landscape photography has, for these reasons, done much to bring about the wonderful popularity of the art, we are equally certain that its facilities for portraiture has done much more. To this branch the amateur does not "take kindly," although we believe that, as a rule, it is with taking "counterfeit presentments" of his friends he usually commences. But the suitable lighting necessary for a successful portrait requires one of two things—either a house where, by means of blinds or otherwise, the model may be illuminated by the needful quantity of light and that falling from the proper angles, or that the operator be possessed of sufficient ability to attain the same ends by suitable arrangements in the open air. That the latter can be successfully done we have abundant proof in an album now before us, containing a series of studies by Rejlander, which were taken in an open garden, with no other accessories than a clothes-screen, some blankets, and a few sheets of brown paper. Such genius is, however, rare, and therefore we say, advisedly, that portraiture is mainly confined to the professional photographer, who caters so successfully, and apparently suits the tastes of his patrons so admirably, that the whole world would seem to be in a chronic state of desire to be photographed and of getting that solicitude satisfied.

In consequence of this almost universal craving for photographic portraiture we are sure that we are much within the mark when we say that for every landscape sold there are at least a thousand portraits, and if that be true, then it is evident that portraiture has had by far the greater influence in extending the practice of photography; and, as on portraiture its further extension most largely depends, it is worth consideration whether the average productions of the present time reach what should be regarded as a fair standard. The answer, we think, is not difficult to find, as an examination of the albums of our friends, and the show-cases of the photographers in any of even our larger cities, gives ample evidence that a considerable number of pictures are sent out which are alike discreditable to the skill or care of the photographer, and do violence to the taste of the subjects of the photographs. That the profession includes numerous painstaking, conscientious, and studious men, whose productions are works of art, we are aware; but that fact only makes it the more necessary for us to bring what influence we can to bear on those whose only aim seems to be to accumulate large gains in the shortest possible time, without apparent regard to the quality of their work.

The success of photographic portraiture is mainly dependent on two things—*posing* and *lighting;* and, as we intend to devote an article to the latter on a future occasion, when we shall include the opinion and practice of some of the most distinguished operators, we shall confine ourselves for the present to the former.

That the success of a portrait depends much on the position of the sitter is a self-evident proposition; but how to secure the best position is not, perhaps, so easily decided—in fact, it is a point that cannot be determined without much patient study. Probably the piece of advice most frequently given is to study the works of the old masters—counsel which is good so far as it goes, but which requires to be followed with no little care. Among other works there is a volume of sketches after Vandyke, published in 1816, every page of which contains a grand old picture that makes all enthusiastic portraitists anxiously solicitous to endeavour to produce something similar. To try, however, is only to fail; photography possesses certain inherent deficiencies which prevent the realisation of the wish; and even if those could be overcome there is still another obstacle in the way. A slight examination will make manifest the fact that although every head is a study in itself, yet there is something more required to produce the effect which the artist has secured, and this will be found in the style of dress of the period, or that which was adopted for artistic purposes. These are found in loose, flowing robes, adjustable into any desired form, every fold and line of which has been made to tell effectively in the composition, and the absence of which, in spite of the fine head, would at once deprive the picture of most of its charm. So much do we believe this to be the case, that we doubt whether even Vandyke could have made more than merely presentable pictures with the tight-fitting garments of the present day. Again: the masters, both ancient and modern, possess a power in the arrangement of the hands to which the lens will not submit.

In Vandyke's portraits of Theodorus Rombouts and Simon Vouet the hands in each picture are made to play an important part in the composition; but it will be at once evident that any attempt made to do the same in connection with the camera would simply result in total failure. While, then, the works of the masters referred to should be the subjects of most careful study they must on no account be copied in a servile manner, as such copies will almost invariably prove to be mere caricatures. Canons of art, like the rules of a spoken language, are to be learned by the study of the works of the best men of all periods; but such canons are only to be used in enabling the student to steer clear of error, while arranging his subject in a position which should always be the outcome of his own mind. Such a student will soon find that each sitter has an individuality peculiarly his own, and that true success in posing consists in making that individuality apparent, at the same time keeping his composition strictly within the laws which he has learned true art is required to obey. If the artist aim at anything short of this he may at once make up his mind to be content with a very subordinate artistic position. Equally certain is he of failure if he attempt to pose by rule. Such work rises above the merely mechanical, and must always be wanting in that ease and grace which, although felt by all, is only attainable by the careful study of each separate model.

It is this specific individuality possessed by each sitter that tends to make anything like copies, as we have already said, simply caricatures. A very good example of this is, perhaps, known to many of our readers. The splendid picture of Sir Robert Peel, by Lawrence, was copied photographically by a large number of artists; but what was the result? Simply that in every case the attempt proved a failure, some of such essays almost approaching the ludicrous—not, be it remembered, because of any inability to exactly copy the admirable pose, but mainly because of its being quite unsuited to the model whom they wished to represent.

We have already alluded to the recognised difficulty with which the photographer has to contend in placing the hands to any extent in advance of the body of his sitter; but we have been told by one artist, who makes a *specialité* of producing large portraits, that the difficulty is not confined to the advanced position, but extends to the open hand, and especially to the separated fingers in any plane. From an examination of a large number of his pictures we are inclined to think there is some truth in this observation; certainly, in the pictures we have seen, whenever the fingers were separated they had a thick, swollen appearance not at all natural, imparting the idea of gout rather than grace. In some cases the defect had been remedied by the brush; but the artist to whom we have referred now invariably closes, or partly closes, the hand, and so gets rid of the objectionable feature.

In thus urging on the general body of professional photographers the advantages to be derived from a determination to try and raise the present standard of their pictorial work, we are aware that many will say that they would gladly do so if they could only get more suitable studios in which to operate; but while we, to a certain extent, sympathise with this feeling we can hardly accept it as an excuse. We have seen the operating-rooms of many of our friends, and the result of our experience is that the studio has in reality very little to do with the final result. It has a great deal to do with the comfort and the convenience with which good work may be done; but some of the best pictures we have ever seen have been produced in apparently the most unsuitable places. Success in the highest degree depends not on the best and most convenient studio, but on the knowledge of how best to use the place and appliances the operator has at command. This knowledge cannot, however, be obtained by any "royal road," but is the result and reward of much patient, persevering study and practical application.

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The paper read at the last meeting of the American Institute—which by the courtesy of the author, Mr. H. J. Newton, of New York, we are enabled to give *in extenso* [see page 270]—contains one or two points worthy of more than passing notice. It will be remembered that Mr. W. Robinson, in our last volume (page 493), in an article upon *The Sensitiveness of Iodide of Silver*, called attention to the relative restraining power of the different haloids, showing that iodide possesses that power in the greatest degree, while bromide and chloride respectively produce less influence upon the sensitiveness of the film. Mr. Newton has taken advantage of this fact in the preparation of bromide emulsions, forming the bromide in the presence of excess of silver nitrate, the excess being afterwards neutralised by means of an alkaline or metallic chloride. Emulsions of great sensitiveness are obtained in this manner, the fog-preventing power of the soluble chloride being fully developed while its action upon the sensitiveness is at the minimum. Mr. Newton's experience as to the part played by the chloride in the redemption of emulsions which have become unworkable from the presence of silver nitrate is extremely interesting. The addition of a soluble haloid to an emulsion which has reached its full point of sensitiveness is well known to keep it in working order for a lengthened period; but we should scarcely have anticipated that the rejuvenating power of a simple chloride would have been so marked in the case of an emulsion which had become totally useless. This is, we believe, the first time that the fact has been noticed. The method of intensification spoken of by Mr. Newton in the latter portion of his article strikes us as a rather peculiar one. We know that tannin acts as a powerful restrainer in the alkaline development, and have used it as a substitute for bromide in that operation; but we were scarcely prepared to hear of its use in connection with silver development, and that in the absence of any restraining acid. However, Mr. Newton's remarks are very clear on this point, as he states that a mixture of pyrogallic acid and tannin with a few drops of plain silver solution form a redeveloper which gives more satisfactory results than the alkaline plan. This is a matter which is worth inquiring into; indeed, we would commend the whole of Mr. Newton's paper to the careful attention of our readers.

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## INFLUENCE OF SILVER IODIDE ON CHLORO-BROMIDE EMULSIONS.—DIFFICULTIES IN EMULSIFYING.

The very great change caused in a chloro-bromide emulsion by the addition of a small quantity of silver iodide is something very remarkable. I alluded briefly to it before, in describing the process, and here desire to state it somewhat more fully.

1. There is the *change in the colour of the film*, particularly by transmitted light. This difference, which is very marked, was also observed by the Editors of this Journal in the report of the results of their experiments.

2. The change in the *actinic transparency of the plate*, which is greater than the mere change in colour would seem to explain. It is to this that the checking of blurring and irradiation is due.

3. The difference in the *colour of the finished image*. Chloro-bromide emulsion plates prepared with the albumen mixture which I have recommended have given me almost always images that were warm grey by reflected light. Chloriodo-bromide emulsions prepared with the same preservative give images that by both reflected and transmitted light are nearly or quite black.

4. But the difference in the *resistance to the hyposulphite fixing bath* is still more remarkable than any of the foregoing. A chloro-bromide plate, not redeveloped with silver, is almost destroyed by the use of a fixing bath of the strength usually employed for wet plates, so that I have been in the habit of using a hyposulphite solution as weak as one part to eighty of water. This rapidly clears a chloro-bromide plate, without materially weakening the image; but the addition of even the small proportion of iodide which I use completely changes this. The one-eightieth solution of hyposulphite will not clear it, and we need a fixing bath as strong, or nearly as strong, as that used for wet plates. This solution, which would be extremely apt to destroy a chloro-bromide plate, scarcely weakens a chloriodo-bromide.

Now one would naturally expect that the addition of a small quantity of iodide would slightly increase the resisting power of the plate, but one would certainly not be prepared to expect so total a change. The fact that such a change takes place leads inevitably to the conclusion that *the silver iodide takes a large part in the formation of the image*, and that the opinion held till lately (which I

quoted in a recent communication) that the silver iodide was mere inert matter, or ballast, is very far from the truth. In fact, the materially-increased sensibility, as I remarked before, would sufficiently disprove this opinion; but the change in the nature of the image adds a striking confirmation.

All this leads to the conclusion that the chloriodo-bromide plate is not in its nature a mere modification of the chloro-bromide, but is essentially different. The silver iodide undoubtedly enters into combination with the silver bromide, and the action of the compound differs materially from that of its constituents. It is only necessary to reflect how utterly an iodide wet plate is changed by the introduction of a small quantity of bromide. The change that results is also in this case no mere modification of the original properties; these are radically altered. The bromo-iodised wet plate has its own character, methods, and peculiarities, all distinct from those of the plain iodide wet plate; and the bromide or chloro-bromide dry plate is equally altered by the introduction of a small quantity of iodide. It is worthy of remark that the proportion of bromide added to iodide in wet plates corresponds approximately to the proportion of iodide which I have found best to add in the case of dry plates; and the reason that iodo-bromised dry plates made with a bath are so inferior to the emulsion plates is plain enough—the relative proportions of silver iodide and silver bromide are exactly the reverse of what they should be.

*Emulsification of Silver Iodide.*—Since the above was written I have received the Journal for April 30 with Mr. Mansfield's note as to difficulty experienced in obtaining an emulsion containing silver iodide. My own experience has been so absolutely free from such difficulty that I have been led to consider the matter carefully, in order, if possible, to find the source of the trouble for the benefit of those who may wish to use my method. I think I have, perhaps, found it.

First, I may remark that Mr. Mansfield by no means followed the formula given. I have strongly urged the necessity of doing this, as success depends upon the relative proportions of the ingredients; neither does it appear that any chloride was present. But apart from these considerations there is another—much seems to depend on the manner in which the silver nitrate is dissolved.

In making an ordinary emulsion, to be used in the ordinary manner, I have always preferred to dissolve the silver in ninety-five per cent. alcohol, without adding water. In the case of an emulsion that is intended to be dried and washed it is evident that the strength of alcohol in the first emulsion is of less importance, as the whole is to be removed. Therefore, as a matter of convenience, I have proposed to dissolve the silver nitrate in a *very little* water. Now silver nitrate can, by heat, be dissolved in about its own weight of water or less. Moreover, I especially mentioned the necessity of adding to this solution *three or four times* its bulk of alcohol, and heating until a perfect re-solution is obtained.

It seems altogether probable that the cause of the difficulty found lies just here—that some have used too much water and, subsequently, not enough alcohol. It might seem unlikely that such a cause could produce such an effect, but I am confirmed in the opinion that it is competent to do so by the following circumstance, which is curious in itself and interesting in its connection with the point in question:—

If silver *bromide* or *chloride* be precipitated from solutions of alkaline chlorides or bromide *in water* by silver nitrate also dissolved in water, the resulting precipitates, even if the silver salt have been in excess, will readily emulsify in collodion (after having been repeatedly washed with alcohol to remove adhering water); but silver *iodide* formed in precisely the same manner (silver also in excess) absolutely refuses to do so.

This I offer as a probable suggestion, not a decided opinion. As I experience in my own work no more difficulty in making an iodide than a bromide emulsion I have not been led to examine the matter very critically; but to anyone who has used my proportions, and has either not obtained an emulsion or only with difficulty, I would suggest to repeat the trial, *using no water at all*, but dissolving the silver nitrate in fine powder in ninety-five per cent. alcohol unmixed, by the aid of heat. If success follow it will be easy afterwards to graduate the water.

I take this opportunity of repeating my recommendation to use *fused* silver nitrate. M. Carey Lea.

## THE CONTINUATING ACTION CONTINUED, AND OTHER MATTERS.

Is the "continuating action of light" a phrase inapplicable to the reaction recently under discussion in these columns? As Mr. Winstanley forcibly puts it, that light cannot act where it is not, appears to decide the question at once, but really is begging the question. That one cannot see light in the dark is true—and there certainly is none in the dark, darkness being the negation of light; but to say there is no light because it cannot be seen is as good reasoning as to say there is no stored heat in water because our thermometers are not sensible thereto under ordinary circumstances. I should state that by the term "light" I mean those rays, visible or invisible, which are said to have the sun as their source, and which, photographically speaking, affect our sensitive materials.

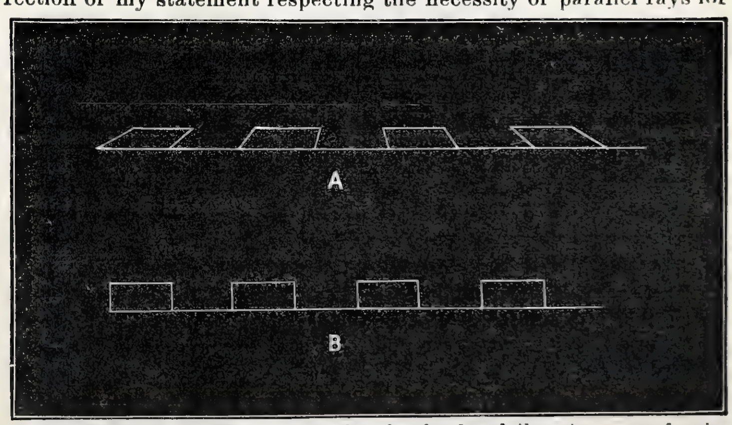
I would not argue that light under the conditions in question becomes in a manner latent; I would only point out that, could no other agent sufficient to produce the given effect be shown and proved to be present, the above would not be a bad theory, and is one which I always understood "continuating action" to imply. Clearly that light acts where it is not is scarcely affirmed.

That a chromated gelatine insufficiently exposed for immediate development is rectified by keeping I have not found; indeed, the impression remains on my mind that the contrary has been proved. That there is an action producing the effect in question I am quite ready to admit; but that it is simply from keeping I should feel inclined to deny. Whatever the agent may be one thing is patent to all, viz., that its action is one that brings about insolubility. If an opinion having some bearing on the subject may be ventured (and to myself it is not altogether unsupported by facts), it is, when the conditions under which a chromated gelatine film is soluble and becomes insoluble are more closely studied, a means will be obvious for maintaining it in the soluble condition any time, and for accelerating at pleasure the light's action in a wonderful degree.

Mr. J. W. Swan, whom we may all look upon as an authority in this matter, has laid down very clearly, and evidently as the result of careful experiment, that a chromated film becomes insoluble by—first, moisture; second, heat; third, lapse of time; and, fourth, by the action of light. Of the first carbon printers are made aware when their tissue is allowed to dry very slowly; in fact, several improvements effected by the Autotype Company have had rapid drying as an object, so as to avoid this danger. Heat has already been suggested as being the possible cause of the discrepancy between the experiments bearing on this subject which has given rise to the discussion. The lapse of time and the action of light are well known to produce insolubility.

Now let us look at a case—not a supposed one, but one stated and, so far as I am concerned, believed to have been accomplished. The case is this:—A piece of tissue, which received only one quarter of the exposure to light to produce a good print upon immediate development, was found after a lapse of time (twenty-four hours) to yield a print equal to a fully-exposed one that was developed immediately. Here, evidently, has been some agent capable of doing *three-fourths* of the work, and doing it *only on those parts where the light had previously acted.* It is not unreasonable to expect that were this agent the lapse of time, or, indeed, any power producing general insolubility, having in the given case the major part of the work to perform, it would leave some considerable evidence of its action in the whites of the print, and it is reasonable also to expect such action would be *diffuse;* yet upon looking at the crisp lines of a map so produced neither of these expectations are supported by the facts.

*En passant*, Mr. Winstanley is to some extent right in his correction of my statement respecting the necessity of parallel rays for




A is a section of a relief from a negative of a chessboard, the extreme rays forming the same having a supposed divergency of 120 degrees. B is a section of a relief from the same negative; but in this case parallel rays alone are used, and at right angles to the negative.

the production of reliefs, and I am to the same extent wrong; yet it strikes me his definition of the indispensable condition would be at

fault if the rays falling on the extreme portions of the negative were very widely divergent, for any divergency between these points—be it one second or 179° 59′ 59″—would comply with his condition. Rays falling on the negative at any angle but a right angle must produce a more or less distorted relief. The question then comes—What amount of departure will produce a relief having so slight an error as to be practically correct? As Tennyson says—"Things seen are mightier than things heard;" so the foregoing diagram may be more explicit than any words of mine. W. E. Batho.

## ON BROMIDE EMULSIONS.

[A communication to the Photographic Section of the American Institute.]

It will be recollected by some of you that I exhibited, last fall, at one of our meetings some emulsion dry-plate negatives. I had at that time just commenced a series of experiments with bromide emulsion, and deemed it advisable not to give any formula until I had completed, or nearly completed, my experiments. The season of the year has arrived when excursionists and outdoor workers are beginning to feel the influence of spring-time. They are brushing off the dust from their bottles and boxes, and studying with more than accustomed interest the photographic journals for something new which is applicable to outdoor work. I have, therefore, concluded to give you the result of my experiments up to this time. It might be rather late if I should defer it to our June meeting.

In making bath dry plates it is necessary that they should be thoroughly washed to free the sensitive film from all traces of free nitrate of silver, otherwise they will not keep. To effect this with less washing, saving thereby time and trouble, I had adopted the plan of putting the plates into a weak solution of chloride of ammonia after washing them in two or three changes of water. This left a trace of chloride of silver in excess, the effect of which was beneficial, if any perceptible effect were produced. The substitution, however, of a solution of bromide for the chloride made a very marked loss in the sensitiveness of the plate, because the bromide of silver would be in excess.

The fact that an excess of chloride of silver in no way injured the dry plates I have used to advantage in my emulsion experiments. I had tried most of the published formulæ that promised advantages over the results obtained by myself. I had washed the emulsion and also tried it, and obtained in these ways very sensitive plates. There was, however, in all these modes the serious drawback of much waste material, and a large amount of labour and expenditure of time.

I sought to get the same or equal results, if possible, in a less complicated and more simple way. To accomplish this I finally adopted the idea of making my emulsion with the silver in excess, and, after a certain period of time, convert the uncombined silver into a chloride of silver by the addition of some of the soluble chlorides, adding sufficient to leave an excess of chloride in solution. In this way I obtained the bromide of silver in a state of equilibrium. I have experimented with various chlorides, but have finally adopted chloride of cobalt or chloride of calcium. If there be any difference in the effect of these two it is in favour of the cobalt. In the course of my experiments I have obtained some (to me) novel and interesting facts, the most important of which is that the addition of a chloride to a bromide emulsion, where the silver is in excess, will redeem it after it has gone beyond the maximum point of sensitiveness and passed into the land of fog. I will now give you some of the formulæ I have tried and the results.

I make my collodion with about seven grains of cotton to the ounce, ether five ounces, alcohol three ounces. In this series of experiments I first took one ounce of collodion and dissolved it in fifteen grains of bromide of cadmium. The silver necessary to combine with this amount of cadmium bromide is about eighteen and three-quarter grains. I added twenty-two grains. At the end of thirteen hours it had gone by, and was to all appearance worthless. I could obtain nothing but fog—not even the trace of a picture. If it had been exposed to the light an hour it could not have been worse. I then added two and a-half grains of chloride of cobalt dissolved in one drachm of alcohol and shook thoroughly. The next day I shook it several times, and on the third day I got a very distinct picture, but foggy. On the fifth day it was much improved. Trying it again, however, on the sixth and seventh days, it appeared to have come to a standstill, there being no advance from the two preceding days. I then added two more grains of chloride of cobalt, and on the eighth day it gave me pictures of extraordinary beauty—seemingly there could have been no improvement in the results.

My next experiment was with the same proportions of *matériel*. I left it, however, after adding the silver, eleven hours before adding the chloride, and at the end of four days it was all right—in results equal to the first. This fogged at the beginning quite as much as the other. With this same formula I next allowed eight hours to elapse after adding the silver; that worked equal to the others in two days' time, with the exception that it was not quite as sensitive.

In my last experiment with this particular formula I gave only three hours before adding the chloride. It worked brilliantly from the first, but was much less sensitive than any of the others. I then reduced the bromide of cadmuim to twelve grains to the ounce and eighteen grains of silver, fifteen grains being the amount necessary to take up the bromide. This, after remaining twelve hours, was treated as before, and next day worked satisfactorily. This established the fact that the larger the quantity of bromide and silver in the emulsion the sooner it came to the condition of fogging and the more time was required to redeem it.

I next tried equal parts of bromide of cadmium and ammonium bromides for salting. I found it exceedingly difficult to dissolve five grains of bromide of ammonium in an ounce of collodion. To obviate this difficulty I took one hundred grains each of bromide of cadmium and ammonium, and dissolved them in a small quantity of water and evaporated to dryness. I found that this compound salt dissolved quite as readily as the cadmium bromide. Without taxing your patience to go through the details with this salting I will give one result only.

I used ten grains of the compound salt above referred to for each ounce of collodion. A longer time elapsed before showing signs of fogging than any of the other formulæ. About fourteen and a-half grains of silver would be necessary to convert the bromide. I added seventeen grains, and the chloride, two grains, in eight and a-half hours after, and in five hours it worked satisfactorily.

Dry plates made from any of these formulæ exhibited great sensitiveness, especially when dry—quite equal, in my estimation, to that of wet plates. I have used them for copying engravings while wet, prepared ready for drying with the preservative. From my experience I think them the most sensitive, however, when dry, although I have not positively settled that point by definite experiments. I have some of these emulsions over two months old, and they have as yet showed no sign of deterioration; if any change have taken place it is, so far, for the better. How long they will continue to improve, or whether their keeping qualities will prove sufficient to make them a commercial article, can only be determined by time. Theoretically, the fact of the soluble chloride remaining in the emulsion would be against their keeping indefinitely.

There are some facts in connection with this theory which are, however, favourable. Collodio-chloride has long been made and sold as a commercial article with good keeping qualities. In all of these I think the same principle is involved, as they all contain chloride in excess—at least all that possess good keeping qualities. For all practical purposes, however, these emulsions leave nothing to be desired, either by amateurs or professional photographers, in regard to their keeping qualities or certainty of results. An emulsion that will keep in perfect working condition two months answers all the requirements that can be reasonably expected in reference to keeping. The bromide collodion can be made in quantities, and the amount of emulsion to be used in a few weeks made when desired. The bromide collodion will keep indefinitely, and is better fit for use after being three or four weeks old.

I have, so far, tried only one preservative, from the fact that I do not think it can be improved upon. It gives with my developer great brilliancy, and all the intensity required—not much, if any, more time being necessary after the developer is on to obtain full strength and detail than in the ordinary development of a wet plate. Several years since I found that a solution of laudanum in water made an excellent preservative for the ordinary dry plate, enabling me to produce negatives of great brilliancy, lacking, however, sensitiveness. I then combined the laudanum with tannin, and thereby obtained a preservative which gave very sensitive plates, and at the same time retaining the brilliant qualities of the laudanum preservative. With this compound I have combined the syrup of squills for emulsion plates. My formula for making this preservative is as follows:—

| | |
|---|---|
| Water | 13 ounces. |
| Tannin | 80 grains. |
| Laudanum | 3 drachms. |
| Syrup of squills | 1 ounce. |
| Alcohol | 2 ounces. |

The tannin is first dissolved in the water and the laudanum added. The adding of the laudanum to the tannin solution precipitates the

gummy matter from the tannin, filling the solution with a light brown, flocculent mass. This should be filtered out before adding the syrup and alcohol; by this means you will get a perfectly clear solution of tannin, which cannot be done while it contains the gummy matter precipitated by the laudanum. After filtering add the alcohol and syrup. This preservative will keep perfectly good for at least a year, and can be used at any time, requiring only occasional filtering. The proportions previously given are right for the emulsion plates when used wet; when dry, however, they are more sensitive, and to get the same brilliancy double the quantity of laudanum should be used—that is, six drachms—no other change being necessary.

The developer which I have used in these experiments is composed of—

| | |
|---|---|
| Water | ¾-ounce. |
| Ammonia conc. | ¼ „ |
| Bromide of ammonia | 5 grains. |

This I designate "No. 1." No. 2 is pyrogallic acid from three to six grains to one ounce of water—using it strong if I find my exposure has been under-timed. To develope I proceed as follows, after exposing the plate (we will take one five by eight inches):—In a wide-mouthed vial I place half-an-ounce of No. 2, and flow the plate after it has been thoroughly washed. If the exposure have been right the image will soon appear. As soon as the outlines of the picture are visible I pour off the solution of pyro. into another vial having previously been supplied with from four to six drops of solution No. 1, and again flow the plate with the combined solutions. The intensity of the negative comes rapidly up to the required strength.

One inexperienced will be likely to get too much intensity, as the plates obtained by this process are, when fixed, of an olive-green colour, therefore very non-actinic. This colour can be changed to that of chocolate by flowing the plates, after fixing, with a weak solution of sulphide of potassium—not more than two or three grains to one ounce of water. This at first will appear to add to the density of the negative, but if continued long enough will reduce it. Negatives so treated have superior printing qualities. It may not, however, be advisable to treat them with the potassium sulphide if the negative appear thin enough when fixed, unless it be allowed to remain on a few seconds only.

In pursuing these experiments I have obtained many interesting results of minor importance, the details of which would make this paper too lengthy; and, as a portion of them are incomplete, shall defer doing more than merely alluding to some of them until a future occasion. I am inclined to think a developer of iron properly prepared can be successfully used, also plain pyrogallic acid and pyro. and tannin.

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Since writing the above my attention has been called to Mr. M. Carey Lea's formula for salting collodion for emulsion dry plates, the novel and important feature of which is the adding a small percentage of the iodide of ammonium to the bromide collodion. Last fall I made a great variety of bromo-iodide emulsions, but in all of them I made the iodide in excess of the bromide. Mr. Lea's idea of making a bromo-iodide emulsion with the bromide in excess struck me favourably, and I immediately gave it a trial, applying my principle of equalising the bromo-iodide of silver with a chloride as before, using only his formula for salting the collodion, which is as follows:—

| | |
|---|---|
| Bromide of cadmium | 8 grains, |
| „ „ ammonium | 2½ „ |
| Iodide „ „ | 2 „ |

to one ounce of collodion. To sensitise this I used nineteen grains of silver dissolved in alcohol in the usual way; five hours afterwards I added two or three grains of chloride of cobalt. The next day it worked quite brilliantly, but the intensity came up very slowly with the alkaline developer. I judged that more bromide salting was necessary. I found with this emulsion increased sensitiveness, but not to the extent indicated by Mr. Lea in his peculiar mode of working it.

I adopted a new mode of developing, in which I dispensed with the alkali entirely. All the detail of the pictures readily appears when the plain pyrogallic acid solution is flowed over the plate after washing. When this development is carried far enough, instead of bringing up the intensity with the ammonia solution I employed tannin and pyrogallic acid, six grains each in one ounce of water. This is flowed over the plate after the plain pyro. without washing it off, and when even action is secured it is turned off into a vial containing eight or ten drops of a plain twenty-grain solution of nitrate of silver. The picture immediately comes up to the required strength, and gives much more harmonious results than with the alkali. The action in the weak lights being more perceptible, no longer exposure is necessary for this mode of development than for the alkaline. I will experiment further in this direction, and report at our next meeting if I find any advantageous change can be made either in developing or formula for salting the collodion.

The preservative I have recommended is, as you will perceive, quite acid. The tannin has an acid reaction, and the syrup of squills is decidedly acid with acetic acid. I have not tried the squills in any other form; the extract is usually obtained by boiling in acetic acid and the syrup of the drug stores, made by adding sugar *quant. suff.* I find some samples contain much more sugar than others; for this reason I intend trying it in some other form than that usually procured at the stores.

Plates prepared with any of these emulsions need no washing, but should be put into the preservative as soon as the emulsion is sufficiently set.

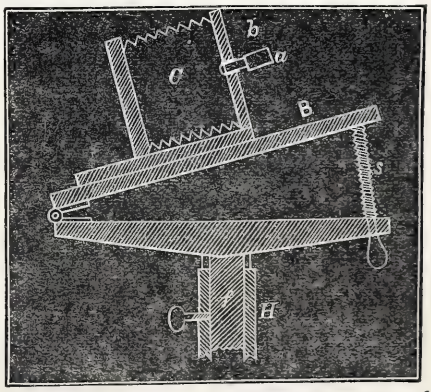
In conclusion: I would remark that one formula with which I experimented showed signs of fogging after ten or twelve days. To this I added two grains more of chloride of cobalt. The next day it had recovered its original brilliant properties. H. J. Newton.

## A SIMPLE APPARATUS FOR PHOTOGRAPHING THE SOLAR SPECTRUM.

In a communication from Suez Dr. Vogel mentioned that he had been making some studies of the solar spectrum in the course of his journey, both on board ship and at the various places where he touched. The particular phenomenon he wished to observe was the inexplicable cause of the wavering of the chemical action, which was sometimes strongest in the blue and sometimes in the yellow rays. These observations he made several times daily between Suez and Aden, and found a remarkable difference between the light early and late in the day, at the former time the violet rays being much the strongest, but, contrary to the generally-accepted impression, the red and yellow rays were also much weaker in the afternoon. In the Levant the violet rays were only perceptible at noon, but near Aden they were visible the whole day. Naturally Dr. Vogel did not set up on board ship the complicated instruments he required at the time of the eclipse, but a simple contrivance—one within the reach of any photographer who takes an interest in spectral researches and who may wish to make observations on his own account.

The requisites are a small camera that will draw out to about six inches, a camera stand, a large cork pierced through the middle, and a spectroscope. Dr. Vogel gives directions for setting it up as follows:—

"Take a pocket spectroscope *a* which consists of two parts—the front, that can be drawn out, and has a slit in it; and a back part,




which holds the prism. Fasten it through a piece of cork, so as to admit no air; push the latter into the opening of a photographic camera C without a lens. Set the whole upon the top board B of an ordinary photographic camera stand; fix the camera firmly upon the board by means of a carpenter's vice (the vice is not shown in the illustration), and right the camera to the sun. The leg *f* moves in the groove H, and can be drawn in all directions, while the screw *s* allows the angle of the camera to be altered at pleasure. The sun's position is easily found by directing the tube of the spectroscope towards it so as to throw no shadow, and its motion is easily followed by the help of the screw *s* and the movable foot *f* as long as one observes the shadows. A heliostat is not required. In order to focus sharply rub the rough side of the ground glass thoroughly with oil until it becomes almost transparent, and with the hand draw out the outer tube (the collimator) of the spectroscope. When the tube has been drawn out far enough the Fraunhofer lines will appear

sharp. This is best observed with a slit. Of course the lines obtained with this instrument are not so sharp as they are with a proper spectral apparatus; but they are quite sharp enough for making studies of the sensitiveness to light of substances, of their power of light absorption, &c. The spectrum is passably visible, and with such an instrument I obtained, at half-past one p.m. on the 22nd January, a picture of the spectrum from H to D in three minutes on a napthaline-red, bromised silver plate. I can recommend this simple apparatus to everyone who wishes to make spectral observations without spending much upon his hobby."

## NOTES ON PASSING EVENTS.

By a Peripatetic Photographer.

I quite understand—it is all "as plain as a pikestaff;" glass has been rendered quite tough, or at least less friable than it used to be, and, therefore, photographers are to be gainers! Thank you heartily; but for what? Of what use is a less brittle glass to photographers? It will be said that our negatives won't get broken. Faugh! What negatives ever do get broken unless when some careless manipulator allows them to fall upon a hard floor, or unless when some "penny-wise" person has taken one on a plate of glass so much curved that it will not stand being placed in the printing-frame. With ordinary care, such as is within the powers of ordinary mortals to bestow, a negative will not get broken even if it be attached to a glass plate more than usually thin. But one thing suggests another. If the fragility of the glass be the cause of extreme anxiety to the owner of a valuable negative, why not seek to have it transferred from glass to paper? This operation is now very easy. But as regards the toughening: the advantages of a less degree of fragility in the glass appears to me to be more than counterbalanced by the impossibility of cutting it with a diamond, and by its necessarily greatly-increased cost. With glass, as a support for negatives, there is nothing much the matter. This may seem rather a strange dogma to be uttered by one who is so little of a conservative as your correspondent; but he believes he is right. Concerning the application of the newly-discovered principle to the making of artificial diamonds and other gems, or to the production of a new kind of glass for lenses, I have nothing at present to say.

The Marquis and Marchioness of Bute are about to proceed to Palestine on an "outing," taking a photographer with them. This is the substance, *in petto*, of a long newspaper paragraph I have recently read. I am not aware whether they are going on business or pleasure, although the reasonable inference to be drawn from the information imparted tends to the latter deduction; if it be so, then if my humble suggestions could possibly reach the mental penetration of persons so highly placed in society and so highly favoured by Dame Fortune, I would say—"You are making a mistake, my honoured friends; for, in order to enjoy thoroughly a picture taken as a memento of a favourite scene, it must have been 'caught' by yourselves. It may not, perhaps, possess the pictorial excellence of a picture secured by an expert; but it would be infinitely more highly appreciated if it were the result of your own efforts." Tourist photography is now a matter of the greatest ease and simplicity, and there is no excuse for any tourist not being his or her own photographic artist.

The addition of nitrate of uranium to a silver bath, as suggested by Colonel Stuart Wortley, does not appear to have been attended with the good results he predicated; for, if we are to judge by what the editors, in a recent leading article, designated "the *experimentum crucis* of dropping a few crystals of nitrate of uranium into the bath," the addition, in at least the hands of one experimentalist, so far from being an improvement has proved to be quite the reverse. And while referring to Colonel Wortley I must reply to what that gentleman has been pleased to term my "unfair attempt to raise a prejudice" against him, by saying here that I only quoted his own written expressions, and if he adopted any mental reservation in connection with what he did write, then upon himself rests all the blame. The English language is probably the most unphilosophical language in the world, but still there is in it a sufficiency of words of undoubted significance from which a writer may select those which convey his ideas without ambiguity. Colonel Wortley now prefers to say that he only complained of "one or two writers" who tried to gain distinction by pursuing a certain course. Will he kindly point out where he made use of the words "one or two writers?" And will he further kindly intimate what conclusion I and others must logically draw if he fail to do so?

Without in the least desiring to take part in the discussion so ably carried on at a recent meeting of the Edinburgh Photographic Society, after the reading of Mr. Bow's paper, I would observe, as suggested by that paper, that a few years ago some large photographs from a few of Thorwaldson's celebrated *bas-reliefs* were exhibited in London, and captivated every beholder possessing good taste. There was about these photographs a "something" which had not previously challenged critical inspection, and the exhibitor, who was an agent or dealer, was believed to have received numerous orders after the exhibition of his specimens. After carefully examining one of these pictures—taken from the well-known figure of *Night* by the Scandinavian sculptor named—I concluded that the whole secret lay in working upon the plaster cast in a manner that was very simple, and I produced a photograph of that subject which, in all but size, could not be distinguished from the photographs to which allusion has been made. Obtaining a suitable crayon I coloured the ground of the *relief*, leaving the subject untouched, or nearly so. I then caused the light to fall very obliquely upon the face of the cast, and took a negative. I am willing, through the courtesy of the Editors, to submit a print from that negative for comparison with any of the photographs to which I have referred, and which excited a *furore* on a small scale. I would gladly have given here full details of the method of preparing the *relief*, but such a dissertation is foreign to the purpose of these *Notes*.

It is gratifying to find that the subject of the preparation of paper by a method that will permit its keeping good for a considerable period is still receiving attention. Several modes of accomplishing this object have already been published, *one* of which I know, from experience, to be undoubtedly excellent and reliable. Mr. W. E. Debenham, of Regent-street, has during the past month published another method by which the whiteness of the paper is preserved. This he does by the addition of ten drops of perchloric acid to the ounce of silver bath. Photographers are indebted to this gentleman for so freely giving them this information.

Speaking as one of the public, I confess to the pleasure I have received from the perusal of so much of the private life of Mr. M. Carey Lea as you have thought proper to publish. With respect to the variety and number of the topics upon which he has written I am not astonished at the redundancy of the record you give in this direction as the outcome of two years alone, for he is, without doubt, the most prolific writer on our art-science—always, of course, excepting those who occupy editorial *fauteuils*—while his observations and suggestions are of that substantial character which cannot be lightly treated. I echo the wish expressed that he may long be spared to enrich photographic literature and its public, by numerous further contributions, as the results of his valuable researches.

*(To be concluded in our next.)*

## FOREIGN NOTES AND NEWS.

The Vienna Photographic Society.—Castor Oil as a Retouching Surface.—The *Mittheilungen* and Herr Haugk on What Constitutes Copyright in Things Literary.—Toughened Glass.—The Carbol-Iron Developer.—New Photographic Society.—Free Lectures on Photography.—Wunder Process of Colouring Photographs.—Removing Varnish from Negatives.

At a meeting of the Vienna Photographic Society there was a discussion upon the cause of the rents in the negative film that sometimes appear in the course of the manipulation or the washing of large negatives which are strengthened with silver and acidified pyrogallic acid after the collodion film has been fixed and dried. In the course of the debate, Herr Carl Haack said that he thought the evil originated in the use of collodion cotton, as it was not observable in albumenised plates. Herr Riewel had observed the same effect in small plates, and blamed the inferior quality of the cotton employed. Herr Fink thought the cause was more likely to be found in watery collodion, and remarked that the tearing generally took place when the water was being run off. Another Member corroborated this statement. Dr. Székely found the best preventive was to hold the plate horizontally and to allow it to dry in that position.

Dr. Hornig showed two mixtures for preparing negatives for pencil retouching which had been sent to him by a Herr Kudrnacek. The first mixture consists of one part of collodion of four per cent. shaken up with two parts of castor oil; let this stand for some time in a moderately warm place, and then thin the fluid with ether and

alcohol. The preparation should now be of the consistency of thick oil, and is ready for immediate use. The second preparation is the same as the first, with a little oil of turpentine added to the other ingredients. He (Dr. Hornig) said that the lead pencil would bite readily on a surface treated with either of these preparations. Dr. Nicol, in The British Journal of Photography for April 21, says:—"Retouching, I am sorry to say, whilst falling into disuse in the best studios in the city, is finding its way into the provinces." Can it be possible that the customers of the "best studios" will be contented with untouched portraits after they have been accustomed to being "made beautiful for ever" by retouching? Surely Dr. Nicol only means that the leading firms are using the retouching pencil more judiciously and less freely than formerly. On the continent, at anyrate, whatever may be the case in the north, retouching seems to be as much in vogue as ever—that is, if one may judge from the number of suggestions for new varnishes or other nostrums for preparing the surface for the pencil which appear in the photographic journals.

A dispute has been going on for some time between the *Photographische Mittheilungen* and Herr Haugk. It seems Herr Haugk has just published a *Handbook of Photography*, and the *Mittheilungen*, in criticising it, said that whole pages of it were taken, word for word, from Dr. Vogel's book without any acknowledgment—that, as Herr Haugk's book did not profess to be a mere compilation, this wholesale borrowing was the less excusable—and that, though "a rose by any other name might smell as sweet," and a process be the same whatever it was called, a complete text-book should give the credit to the real inventor as far as it could. Herr Haugk denies having borrowed from Dr. Vogel's book, and adds that he by no means considers himself obliged to say anything about who invented any process, it being enough for his purpose to know that such and such a process exists and how to work it. So in its last issue the *Mittheilungen* gives in parallel columns a page from the chapter *On Silver Baths* in Herr Haugk's book and the corresponding page from Dr. Vogel's book to prove that it is not without reason that it accuses Herr Haugk. But besides the page given *in extenso* it gives references to chapter and verse of both books for a number of other passages, and then asks what Herr Haugk has to say for himself after such an exposure. So the matter rests at present, and from it we may learn that literary copyright law in Germany is in about the same unsatisfactory state as photographic copyright.

Almost all the foreign journals are enthusiastic about the revolution to be worked in the employment of glass by the new toughening process. Photographers look upon it favourably, with an eye to less fragile baths, dippers, &c. The *Sprechsaal* is almost the only journal that takes a different tone. It warns photographers not to be too enthusiastic until the power of toughened glass to resist the action of time, of the atmosphere, and, above all, of chemicals has been more fully tested, lest they find that the increased hardness of the glass is purchased at the expense of some other quality equally important to them. The principal glass manufacturers and opticians in Paris were present at some experiments undertaken by M. de la Bastie for the purpose of discovering how the toughening affects the lenticular qualities of glass, but the result has not yet transpired.

Some time ago Herr Krüger, of Berlin, recommended a carbol-iron developer of the following proportions:—Six parts of carbolate of iron and one hundred and twenty parts of water, to which add two parts of alcohol and one part of glacial acetic acid (when the silver bath is old, two parts of glacial acetic acid). This developer deposits a fine silvery-white sediment, easily distinguished from the greyer and coarser deposit left by sulphate of iron. The solution remains unchanged for a long time without any addition of alcohol and acetic acid, and it is considerably cheaper than pure sulphate of iron on account of the smallness of the addition of alcohol and acetic acid required. According to Herr Krüger's remarks in the *Photographische Archiv* a negative developed with his solution appears over-exposed when looked at with the light falling upon it; but when one looks through the negative this appearance is seen to be due to the great brilliancy of detail, not only in the well-lighted parts, but in the deepest shadows, so that with this developer the exposure can be a good deal shorter than with the ordinary one. He also says that, comparatively, carbolate of iron is to sulphate of iron as the latter is to pyrogallic acid.

Several of the members of the Berlin Photographic Society undertook to report the results of experiments with it. Herr Gertinger's report was favourable; but Herr Beyersdorff said he had given it a fair trial without observing any remarkable difference between it and the ordinary iron developer. No other members seemed to have tried it. At a subsequent meeting Herr Gertinger showed two negatives, or, rather, halves of a negative—one developed in the ordinary way, and the other with Krüger's iron carbolate—in support of his former verdict in favour of the latter. Further experiments are to be made with it.

On the 20th January of this year the Photographic Society of Bremen held its first meeting. About thirty members were enrolled.

The course of lessons in photography, under the direction of M. Rommelaere, commenced on the 20th ultimo, at the *Musée Royal de l'Industrie*, Brussels. As in former years the course will consist of twelve theoretical lessons, while demonstrations of a practical or experimental nature will be arranged to suit the convenience of the students. These lectures are open to all, and are given gratuitously, a complete stock of apparatus, together with an extensive library, being placed at the disposal of those who choose to avail themselves of the privilege. The list of subjects chosen comprises every possible branch of photography. The first lecture will be devoted to the history of the art—the properties of light, apparatus, chemicals, and processes being treated in turn. Judging from the published syllabus a most complete course of instruction may be expected.

The Wunder process of colouring photographs is communicated to the *Photographische Archiv* by Herr Haugk. A vigorous impression is obtained in the printing-frame, and is toned to a blue-black colour. When washed and dried it is covered with a varnish composed of spirits of turpentine ninety grains, gum mastic fifteen grains, and Venice turpentine eight and three-quarter grains. This renders the image transparent. It is then mounted with its face in contact with a plate of glass, the colour being applied to the back of the picture. It is then finally attached, by means of a thick solution of gum arabic, to a stout Bristol board.

The same gentleman gives, in the *Photographische Correspondenz*, a simple means of removing the varnish from negatives which may require intensifying or otherwise. The plate is flooded two or three times with alcohol in order to soften the varnish, which is then easily removed by treatment with strong ammonia. After washing thoroughly the negative is ready for further treatment.

## PHOTOGRAPHY IN COURT.

### A DISPUTED PHOTOGRAPHIC PARTNERSHIP: A CURIOUS CASE.

### Whaite *v.* Monte.

At the Bloomsbury County Court, on the 22nd instant, this case was heard before Mr. Judge Russell, in which the plaintiff, who is a photographer, of 56, High-street, Camden Town, sued the defendant, who alleged to have been in partnership with him in January last, to recover compensation for a breach of contract and for the value of negatives and other property detained by the defendant. Mr. Willis appeared as counsel for the plaintiff, and Mr. Harris, instructed by Mr. Poncione, for the defendant. The plaintiff, who said that his professional name was Russell, stated that at one time he owed the defendant £33 for arrears of rent, when the defendant agreed to buy certain fittings and apparatus from the plaintiff for £21, and after this transaction the defendant offered to take the plaintiff into partnership with him on condition of the latter giving up the whole of his time and introducing his connection, in return for which he was to pay no rent, and, after the payment of working expenses, was to receive half the profits. This arrangement was entered into upon the 15th of January last, when a lady was engaged as manageress, who, after paying all the expenses, handed to the plaintiff a moiety of the net receipts. After this arrangement had existed for some time the defendant removed the negatives to his other establishment at Wood Green, with 5,000 cards upon which the names of "Monte and Russell" were printed. The negatives were of some value, so also was the goodwill of the business, and it was for compensation on this account that the present action was brought.

In cross-examination the plaintiff said that the defendant was not indebted to him, but that he owed the defendant £12 at the time he was turned out, and had paid no part of the local rates or taxes during the nine weeks he was connected with the defendant, although liable for half of them, nor had he paid for a single chemical or article in the business during the time he was in it.

Miss Emily Taylor, being called, stated that she was engaged by the defendant to receive customers, to keep the books and cash, and was ordered, after all expenses were paid, to hand over to the plaintiff half of the net receipts; but she did not understand that there was any partnership existing between the parties, and always looked to the defendant for her salary. In cross-examination witness said that the

plaintiff had on one occasion taken 2s. 6d. without accounting for it, and on another had taken some *cartes* home to a barman in King-street. Several other customers called complaining of paying their money without receiving their *cartes*. In answer to the learned Judge, the witness said she only saw two receipts with the names of "Monte and Russell" on them, and that all the materials for printing were removed to Wood Green three or four weeks before the plaintiff left.

This evidence completed the plaintiff's case, when Mr. Harris contended, on the part of the defendant, that as no partnership had been proved the plaintiff had failed to establish a case, and called

Mr. Monte, who said he was a photographer carrying on business at Wood Green, but was never in partnership with the plaintiff, who merely rented his house in High-street, Camden Town, and who, in January last, owed him £33. The defendant took from the plaintiff some goods and an I O U for £12. Afterwards finding the plaintiff in difficulties he (defendant) gave him time for payment until he got round again, on condition of his giving up possession of the premises and cancelling the agreement existing between them. After that it was arranged that if the plaintiff could get up any portrait clubs he should have half the profits, the defendant paying all expenses, and stipulating that if the speculation proved a failure it could be relinquished at any time, and this was the only arrangement entered into with the plaintiff. The witness said he had not given permission to have cards printed with the words "Monte and Russell" on them, which he had not seen till the last week of the plaintiff's engagement, and he had had no intimation that the plaintiff ever considered himself a partner till he was discharged.

After a long cross-examination of the defendant, the learned Judge said that as the trial had lasted the whole day he would read over the evidence and deliver judgment in a week. This he accordingly did on Thursday, the 27th ult., remarking that this was a case in equity as to a partnership or co-partnership, and that on the 15th of January a connection existed which led to the present action, in which the plaintiff and defendant were at direct issue. The plaintiff had been only in connection nine weeks. The cards bearing the words "Monte and Russell" had been printed and used by the defendant, but at the time the defendant had no idea of a partnership. And, again, looking to the evidence of Miss Taylor, who was called on the part of the plaintiff, it completely established the fact that no partnership existed between the parties, and it appeared to him that the relation between the parties was merely one of master and servant. The judgment would therefore be in favour of the defendant.

# Our Editorial Table.

### Every Man His Own Photographer.

By the Liverpool Dry-Plate Company.

This the most recently-issued *brochure* in connection with photography is rather a course of instructions in the use of the dry plates of the Liverpool Dry-Plate Company in particular than of photographic processes in general. It assumes that the intending photographer is quite ignorant of any dry process, and, taking him by the hand, it indoctrinates him in the shortest and best methods of obtaining negatives. The instructions are very plain and concise, and it is not easy to see in what manner failure can ensue if the instructions be implicitly followed.

The manual will be useful to more than the mere tyro, for it contains much that is excellent and practical with respect to the latest development of photography, viz., plates prepared with emulsion that does not necessitate either washing or preservative; and on this account alone, if on no other, dry-plate tourist and landscape photographers will doubtless make themselves acquainted with its contents.

We have very often described the means by which such an emulsion as that in question is used in the preparation of *dry* plates. From the following brief extract it will be seen that these pellicle emulsion plates may be used *wet* as well as dry. This is a fact of which every emulsion worker has long been aware, but no detailed directions concerning the best mode of working them in this way have hitherto been given. Having described the method of coating plates with emulsion, the authors of the little work say:—

"To use these plates wet they must be coated as above, and as soon as fairly set, which ought not to be above a minute, they must be immersed in a bath of of dilute albumen prepared as follows:—To one ounce of albumen add thirty of distilled water and five drops of aqua ammoniæ; after shaking well until the albumen is thoroughly dissolved, filter into a wide-mouthed bottle, and allow to stand for an hour open. This solution may be poured into a flat tray like those recommended for development, or into one of the vertical baths used for ordinary wet collodion. The plate may be left here from three to five minutes or even much longer if necessary, but it is better to remove it as soon as the albumen flows smoothly over the surface on raising it out. It must be put into the slide, after draining it on blotting-paper till it ceases to drip, and, after exposure, wet under the tap again and developed in the same way as the dry plates. If the plate be put too soon into the bath or kept there too long the film may have a tendency to lift, so that the fluids get under, and this must be guarded against by leaving the plate longer before dipping and taking out as soon as the albumen flows freely over it. The development will be slower than with the dry plates, but any degree of density may be reached, and the rapidity is very much greater. The plates may be kept in this state in a plate-holder or tight plate-box for twenty-four hours or more.

"The use of a new and too strongly alkaline albumen bath will produce a multitude of minute spots on the plate, which are insensitive and leave transparent spots in fixing."

We commend the manual, both as being a capital guide to the use of emulsion plates and also as containing many hints which will prove useful to the general landscapist.

### Microphotographs.

By Lewis Hughes, Liverpool.

At a former period we referred to the finish and fine definition obtained by Mr. Lewis Hughes in his microphotographs. Several recently-produced specimens now before us are in some respects in advance of any of the previous efforts of this enthusiastic amateur. They are all mounted on cards of the cabinet size, the respective pictures almost filling up all the card. In nearly every case these specimens have been produced by a "two-thirds" objective, this power being used in some instances alone, and in others in conjunction with an amplifier. This amplifier consists of an achromatised plano-concave, which is placed at the distance of a few inches from the objective, and its great value is strikingly shown in two pictures of the same object, the *Acarus of Sparrow*, one of these being not only one-half larger than the other, but much sharper and fuller of detail. From the superior sharpness obtained by the use of the amplifier we infer that this additional lens may be made use of with much effect as a means of correcting the chromatic aberration which necessarily exists in all good microscopic objectives when used without an eyepiece. By employing a carefully-constructed amplifier two ends should be gained—the over-correction of the objective may be neutralised, so as to bring the chemical and visual foci to coincide on the sensitive plate, and the image, at the same time, be greatly magnified.

Among these specimens the *Female Acarus of Horse* demands special commendation for its perfection; nor is the *Tongue of Cricket* in anywise inferior. We observe that one of the specimens has been produced by artificial light, an exposure of only sixty seconds with wet collodion and the oxyhydrogen light sufficing to produce one of the finest in the collection.

Mr. Hughes informs us that in this interesting branch of our art-science, of which he is an accomplished master, he finds dry plates an immense boon. In the morning, before breakfast, he can expose all the plates he requires, go to business during the day, and develope the negatives in the evening. In this way the greatest possible amount of pleasure may be obtained from the pursuit of microscopic photography. We shall shortly have more to say on the use of the amplifier.

# Meetings of Societies.

## PHOTOGRAPHIC SOCIETY OF MARSEILLES.

The ordinary meeting of this Society was held on Friday, the 30th April. After the transaction of the usual formal business,

The Secretary (M. Leon Vidal) laid upon the table the *Bulletin de l'Association Belge de la Photographie*, remarking upon the value of that publication and the success which has attended its introduction. He (the Secretary) then gave an account of his recent tour through France and Belgium, calling particular attention to the newly-formed Belgian Society and its labours in connection with the advancement of all branches of photography. He had found, he stated, in the course of his travels, that the extent to which the popularisation of photography had reached was almost beyond conception, and that even greater advancement was promised in the immediate future. The greatest improvements he had noticed were in the direction of carbon printing, by processes analogous to those of Mr. Edwards and of Herr Albert. He specially mentioned in this connection the names of MM. Blochouse of Brussels, Maes of Anvers, and Ch. d'Hoy of Gand, the carbon process being in a fair way to supplant all others in Belgium. In Brussels alone two of the principal houses have ceased entirely to employ silver printing. He mentioned the names of M. Thiel and M. Rousselon as occupying the front rank in Paris in working out the processes for printing in fatty inks, remarking upon the quality of the results sent out by their respective firms.

A discussion arose as to the relative value of French and foreign publications devoted to photography. It was agreed that both England and Germany were in advance of, while Belgium, thanks to the Society's *Bulletin*, was quite equal to, France in that respect. One of the members having spoken of the *Moniteur* as being a journal devoted to the interests of a clique.

M. VIDAL expressed himself very strongly, against this opinion, stating that no facts could be adduced to support it. On the contrary, its columns were open to all. It was rather open to the reproach of being too accessible, communications being accepted which really contained nothing new or of general interest to the subscribers. This M. Vidal thought the best proof of the impartial treatment which correspondents received at the hands of the editors. He (M. Vidal) also spoke of a visit paid to Dr. Monckhoven, who is at present engaged in a series of experiments in connection with collodion and pyroxyline. He finished by expressing an opinion that ere long it would be found possible to produce blocks for printing in half-tone in connection with type.

The meeting was shortly afterwards adjourned.

# Correspondence.

## URANIUM IN THE NEGATIVE BATH.

*To the* EDITORS.

GENTLEMEN,—Having been asked how I added the nitrate of uranium to the nitrate of silver baths, and if the nitrate of uranium was *acid*, you will oblige me by publishing, for the benefit of all, the following answers and remarks:—

Referring to the results of my experiments published in last week's issue of THE BRITISH JOURNAL OF PHOTOGRAPHY:—In experiment A I simply added the crystals of nitrate of uranium to the solution of nitrate of silver, and when the uranium was dissolved, which it readily does, I used the compound solution *without filtering*.

In all the other experiments I added the crystals of nitrate of uranium to the solutions of nitrate of silver, and *filtered* them before sensitising the plates. The filtering made no difference, nor do I see how any difference could have been produced if I had added crystals of nitrate of silver to solutions of nitrate of uranium, for no precipitation is produced by adding a solution of nitrate of uranium to a solution of nitrate of silver, neither does precipitation ensue by adding a solution of nitrate of silver to a solution of nitrate of uranium. Nor does it appear reasonable to suppose that the results of the experiments could have been otherwise if I had mixed solutions of nitrates of silver and uranium instead of dissolving the nitrate of uranium in the silver solutions.

Respecting the *acidity* of the nitrate of uranium, I think that a very trifling, if any, objection can be grounded on that; for the nitrate of uranium was obtained from one of the best makers of such compounds, and it contained very little, if any, free nitric acid. But, supposing that it had been a *very* acid sample, that could not possibly have produced the retardent effects that the experiments revealed; for it is well known that a considerable quantity of nitric acid can be added to the silver bath without decreasing its sensitiveness to any appreciable extent when a bromo-iodised collodion is employed. I fear that it is by the addition of uranium alone that sensitiveness is diminished, and that all future experiments will only tend to confirm my statements. It will, however, afford me the greatest pleasure to receive evidence to the contrary, and to find that I have arrived at an erroneous conclusion.—I am, yours, &c., J WERGE.

*11a, Berners-street, London, W., June* 1, 1875.

[By way of append to Mr. Werge's communication we add the following extract from a letter we have received from the Rev. F. Hardwich:—"It occurred to me, on reading over your article this morning, that the sample of nitrate of uranium may possibly have contained free nitric acid. Still, I cannot see how, under any circumstances, such a salt can increase the sensitiveness."—EDS.]

## GELATINE *VERSUS* COLLODION.

*To the* EDITORS.

GENTLEMEN,—I see in Colonel Stuart Wortley's paper in the last Journal some theories broached as to the gelatine process which seem to me so entirely opposed to the results of my own practice that I must beg you to allow me to say a few words in vindication of the process and in justice to Mr. Kennett.

Colonel Wortley denies that these gelatine plates possess the superior sensitiveness so often claimed for them. Many months' practice with Kennett's pellicle enables me to assert, on the other hand, that gelatine is more rapid than any collodion process, whether emulsion or otherwise.

My favourite test-subject is the interior of Wallasey Church. This is full of non-actinic light from the number of stained glass windows in it, and requires a very prolonged exposure. With Henderson's rapid bath and Stuart's instantaneous collodion I find that the time for a wet plate, kept moist with blotting-paper, and on a bright day in May, is an hour and a-half. A Wortley plate, or one of the Liverpool rapid dry plates, requires five or six hours in order to obtain detail in the shadows. This I have ascertained by repeated trials.

Last Monday I exposed a gelatine plate in the church for twenty minutes and obtained an excellent negative. The emulsion from which it was prepared contained two drops per ounce of a twenty-five-grain solution of bromide of ammonium, and was, therefore, somewhat slower than the ordinary pellicle plates. I took two fine $9 \times 7$ negatives of a drawing-room last week with an exposure of five minutes; and I am quite sure, after several years' practice at interiors with every available process, that only the gelatine will give such a result. It will be an exceedingly great boon to the archæological photographer to be able on a tour, with only a few minutes' delay, to secure a negative of a cathedral interior; and this advantage we owe to Mr. Kennett.

Then, as to latitude of exposure: I prepared the other day a batch of plates from an emulsion containing two grains of a twenty-five-grain solution of bromide of ammonium to the ounce, and exposed four of them on a well-lighted subject in a room for ten, twenty, thirty, and forty seconds respectively. These plates were developed in a dish together after a bath in bromide of ammonium. The thirty-seconds' plate was an admirable negative, and required no intensifying; but, strange to say, each of the others came up to the excellence of No. 3 after a little dosing with acid silver.

I have discovered another advantage attending the use of this process, viz., that gelatine plates require no trouble in cleaning for future use. Hold them under a tap of hot water till the film dissolves, then wipe them dry on a clean cloth, and they are ready for use again, and give perfectly clean films.

Forgive me for occupying so much of your valuable space in the enthusiasm of one who feels that, thanks to Mr. Kennett, he is in possession of a new and unhoped-for power as a photographer.—I am, yours, &c., H. J. PALMER, M.A., *Oxon.*

*Wallasey, Birkenhead, May* 27, 1875.

## THE OLEO-BROMIDE PELLICLE PROCESS.

*To the* EDITORS.

GENTLEMEN,—I was very glad to see your remarks on bromide of cadmium in last week's Journal. I have, in the course of my experimental work, found samples of this salt vary considerably, and am quite sure that when any degree of accuracy is required in calculations the volumetric test should be resorted to, and especially so when using a fresh supply.

The double bromide of cadmium and ammonium spoken of so favourably by you is, I believe, a very stable salt, and in my hands has given the best results. Mr. H. Cooper's allusion to it, in an article on the collodio-bromide process in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1871, induced me to try it, and I have never regretted adopting his suggestion.

I must now apologise for a rather serious error in my formula for oleo-bromide pellicle. In place of sixty-*four* grains of nitrate of silver to four ounces of collodion, sixty-*eight* grains should be used. The mistake arose from a miscalculation of the strength of a stock solution which I had been using. I found it out the other day after preparing some pellicle with new solutions. The plates were so unusually slow that I overhauled my notes, and soon discovered the cause. Sixty-four grains give very good plates, but they are not nearly so sensitive as those prepared with the larger quantity of silver.

I now recommend white Castile soap in preference to soft soap, as I find it more reliable. I have obtained very good results with some samples of soft soap, but very indifferent results with others. Ten minims of the solution to each ounce of collodion will be found the best proportion. The method of making this saturated solution will be found in Mr. Bolton's article on washed emulsions in your ALMANAC for this year.

Nitrate of uranium, valuable as it is in emulsions containing excess of silver, may be dispensed with in making emulsions for pellicle where bromide is finally in excess. I have recently prepared pellicle with two similar collodions—one with, and the other without, the uranium—and found that the plates made with the plain collodion pellicle were the more sensitive of the two.—I am, yours, &c., JOHN B. C. FOX.

*Lutterworth, June* 2, 1875.

## PROCESS VENDORS.

*To the* EDITORS.

GENTLEMEN,—Dr. Nicol has been pleased to utilise my query as a text whereon to preach his favourite sermon, or, rather, as an excuse whereon to further propagate his favourite libel.

I quite agree with him, however, that if any one have sold what he knew to be an old and worthless process, representing at the same time that it was new and of much use, his conduct in that particular can be meritorious of nothing else but blame. But the probabilities are much against such a supposition being true. As Macaulay has observed—

"Wise men have always been inclined to look with great suspicion on the angels and the demons of the multitude." It is true that no elaborate defence has been set up against the charges your correspondent makes; but this is surely not a matter for surprise. The vendor of a process is bound in honour to his clients not to openly discuss forthwith at anyone's demand the details of the method which he sells. Without such discussion, however, he has no defence, and must bear as best he can the studied aspersions of vindictiveness.

I have but little knowledge of those northern regions from whence Dr. Nicol's plaintive *Notes* descend, but, if the notions of valour and bravery which there prevail are at all akin to ours, little glory will be his who elects to press attack when it is known his adversary may not without dishonour use his only potent method of defence.—I am, yours, &c., D. W.

*May* 31, 1875.

## EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at the small cost of one shilling in our advertising pages. This column is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

I will exchange a landscape lens, for 12 × 10 plates, by Horne and Thornthwaite, for a studio chair.—Address, John M. Powell, 43, Charles-street, Milford Haven.

Black Japan lantern, with three and a-half inch condenser, gas jet, large bag and boards, also Solomon's magnesium lamp in perfect order, to be exchanged for cabinet lens and camera with repeating-back for two *cartes*.—Address, Tear, 12, Clapham Road, S.W.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

Photographs Registered.—

Walter A. Smith, Ipswich.—*Portraits of Lord Waveney* and of *J. Allen Ransome, Esq.*

B. B.—The gentleman has returned to this country.

X. Y. Z.—Such a business as that you describe is worth about fifteen hundred pounds.

Quiz.—Apply to the keeper of the park. We do not, however, imagine that any difficulty whatever will be interposed.

Victim.—On looking over our old files we find that a copy of the advertisement inquired about appeared in the supplement to our issue of August 11, 1865.

⁂ We are unavoidably compelled to leave over some reviews, among which is that of Dr. Vogel's recent book, *The Chemistry of Light*. This in our next.

Antipas.—The lens marked "No. 30" is about five times more rapid than the other of the same focal length, while it is about one-half slower than that indicated as "No. 8."

Horatio.—For keeping negatives in good condition when not in use no better method exists than packing them up in parcels of a convenient size with a fold of blotting-paper between each.

Old Subscriber.—Although the pictures are excellent they will not, we imagine, command more than a local sale, and from the indigence of the locality that, at best, must necessarily be very small.

W. Barnard.—The patent is still in force, the sum of fifty pounds having been paid to secure its extension. You must observe, however, that by this extension the validity or invalidity of the patent is not affected.

B. J. M.—1. You have been misinformed; pale lacquer is used by French as well as by English opticians.—2. There are several lenses to be met with of which it is absolutely impossible to determine the nationality from whence they have come.

Edina.—We have no doubt that the dry plates were deteriorated by the fumes—probably sulphuretted hydrogen from the drain-pipe. The best way to utilise these plates is to print transparencies on them, giving a tolerably long exposure, and developing the image by an *acid* pyrogallic and citric solution.

B. Johnston.—The addition of iodine to varnish will certainly render it suitable for use in the production of non-actinic glass; but iodine is inferior to several other colouring bodies in consequence of its volatility. Among the aniline colonrs are to be found several which will better answer the purpose intended.

Vincent.—This correspondent writes concerning a matter on which we are scarcely able to advise. We shall, however, allow him to state his own case. He says:—"I enclose a *carte*. Would you kindly say how and when the photographer of the same received the 'medal?' and if he never has been the recipient of a medal is it legal to gull the public in this way?"—— On the back of the card in question are the royal arms; the words "First-class medal, London, 1873;" a medal with its obverse showing the Prince of Wales and the International Exhibition; together with the name of the photographer. The question arises—Is this fraudulent? Perhaps some reader skilled in legal matters will throw light on the subject.

J. G. R.—To prepare oxide of silver for adding to the nitrate bath, make two solutions—one of nitrate of silver and the other of caustic potash—and pour one into the other until no more precipitate is seen to fall. The dense brown powder that falls so copiously is the oxide sought for; but before being used it must be washed by pouring several changes of water over it, followed by decantation.

Martin Cooper.—The following is a general account of the method of producing vitrified photo-enamels by substitution:—Make a collodion positive, remove the film from the glass, and transfer to a toning bath containing the chlorides of platinum, iridium, palladium, or indeed of any other metal that will tone; and then place the film upon the enamel, and, after drying it, apply heat.

Operator.—The mealiness in the prints arises from your having used the toning bath too soon. Such a bath as yours ought to be kept for twenty-four hours after preparation before being used. On referring to our Almanac, from which you say you take your working formulæ, we find that special stress is laid upon the importance of not using the bath until it has been made for the above interval of time.

Chlorine.—To make such publication as you invite would be to raise a hornet's nest about our ears. It is very unsafe to institute comparisons concerning the respective degrees of honesty and skill among tradesmen; and to us it would be very unpleasant, for it would be certain to put our correspondence columns in such a state of fermentation that several months must elapse ere peace would again reign in that quarter. Still, thanks for the memorandum.

R. M'Farlane.—Chlorine is a fertile source of white spots like those on the specimens. Has any lime obtained access to them? Had the prints been mounted, we should have advised you to examine and see if they had not come in contact with bronze powder from the ornamentation so frequently to be seen on the backs of mounts. Before giving advice that could prove useful it would be necessary for you to apprise us of the whole circumstances under which the prints were produced.

B. B. (Clapham).—A sulphocyanide of gold toning bath may be prepared as follows:—

| | |
|---|---|
| Sulphocyanide of ammonium | 40 grains. |
| Chloride of gold | 2 „ |
| Water | 4 ounces. |

If the toning proceed too slowly the solution may be slightly warmed. A much greater variety in the tones may be obtained by means of this bath than by any other.

H. S. Drummond.—By adopting the following method you will not experience any difficulty in reducing the intensity of those prints which have been over-printed:—Make a solution of cyanide of potassium and immerse the prints one at a time, transferring them, when reduced, to a vessel of water. We have been much astonished at discovering what a very strong solution is necessary to reduce the intensity of some prints; we had, last week, occasion to use a solution of more than double the strength of that commonly used for fixing negatives.

Major Hart.—The following is a good developer for collodion positives:—In ten ounces of water dissolve a hundred and twenty grains of protosulphate of iron, and to this add an ounce of a saturated solution of gallic acid. This will now become of the colour of writing-ink, from which, in composition, it does not differ in any marked degree. Now add nitric acid, drop by drop, until the blackness disappears and the solution become of a pale greenish colour; after which add a small quantity of acetic acid. The developer is now ready for use. It produces pictures having excellent whites, although of a slightly metallic character.

## METEOROLOGICAL REPORT,

*For two Weeks ending June* 2, 1875.

Observations taken at 406, Strand, by J. H. Steward, Optician.

These Observations are Taken at 8.30 a.m.

| May. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 20 | 29·77 | SW | 49 | 53 | 58 | 45 | Fine |
| 21 | 29·80 | SW | 55 | 58 | 71 | 53 | Fine |
| 22 | 29·83 | SW | 51 | 57 | 66 | 53 | Cloudy |
| 24 | 30·43 | NW | 50 | 54 | 72 | 46 | Dull |
| 25 | 30·29 | W | 52 | 57 | 71 | 49 | Dull |
| 26 | 30·25 | N | 47 | 53 | — | 48 | Cloudy |
| 27 | 30·26 | N | 46 | 53 | 62 | 48 | Cloudy |
| 28 | 29·89 | NW | 52 | 57 | 65 | 52 | Dull |
| 29 | 29·79 | NNE | 48 | 50 | 56 | 49 | Raining |
| 31 | 30·02 | SE | 47 | 52 | 66 | 43 | Dull |
| June. | | | | | | | |
| 1 | 30·14 | E | 51 | 55 | 75 | 47 | Dull |
| 2 | 30·14 | E | 51 | 61 | — | 52 | Fine |

CONTENTS.

THE BRITISH

# JOURNAL OF PHOTOGRAPHY.

No. 788. Vol. XXII.—JUNE 11, 1875.

## A "FIXING" AGENT THAT WILL NOT FIX.

At the last meeting of the London Photographic Society Mr. G. Hooper read a paper advocating sulphocyanide of ammonium as a superior agent to hyposulphite of soda for fixing albumenised paper prints. We have seldom listened to a more useless—we might even say a more mischievous—paper than this one, because by ignoring past experience its tendency was to mislead. We yield to none in our desire to do everything to render silver prints permanent. When M. Meynier, in 1863, proposed this salt as a substitute for hyposulphite of soda the subject attracted very much attention. Great hopes were entertained that it would do what was promised; but after a lengthened experience it was finally abandoned—not on account of the expensiveness of the salt, but because it failed to do the very thing it proposed; *it did not fix the prints.*

As Mr. Hooper professed to treat the subject historically he was bound to refer to more than the rose-coloured statements of M. Meynier and early sanguine experimentalists. Had he followed up the records of the investigation of the subject, as published in the photographic journals—and in a professedly-historical account he ought to have done this—he would have found why this salt has fallen into disuse. By referring to the records of the period it will be found that numerous capable experimentalists gave the sulphocyanide a more than usually careful investigation, and at last one of the very persons who introduced it to the English, and to whom Mr. Hooper complacently alludes as an authority in its favour, published, as the result of trial, that it utterly failed as a fixing agent, and that hyposulphite of soda was altogether preferable. All this Mr. Hooper ought, in common fairness, to have stated in giving the photographic history of the salt. This information he either did or did not possess, and in either case was unfitted to speak on the subject.

Lest any should be tempted to follow Mr. Hooper's misleading advice we will quote from two of the experimentalists of the period the results at which they arrived, mentioning incidentally that both started with the belief that sulphocyanide could really be used as a fixing agent for silver prints. Mr. M. Carey Lea, in 1866, published in this Journal, vol. xiii., page 508, a lengthy investigation of the peculiarities of this salt in toning and fixing. His words are so much to the purpose that we republish the portion referring to the relative value of hyposulphite and sulphocyanide as fixing agents:—

"A careful examination was next made of the value, both absolute and relative, of hyposulphite and sulphocyanide simply as fixing agents.

"For this purpose albumen paper was sensitised on a fifty-grain solution of nitrate of silver. It was then carefully washed to remove the free nitrate of silver. It was then cut to pieces and treated in the following manner:—

"1. A solution of hyposulphite of soda was prepared—the strongest usually employed in fixing positives, namely, one part of hyposulphite to four parts of water.

"2. A solution of sulphocyanide of ammonium was prepared, of the strength usually directed, namely, one part of sulphocyanide to two parts of water.

"Pieces of the prepared paper were placed in these solutions and left in them for five, ten, fifteen, twenty, and thirty minutes respectively, during which time they were frequently agitated. Before throwing them into the washing basin the papers treated with sulphocyanide were all duly passed through a second solution of sulphocyanide.

"All these papers, after being thoroughly dried in the dark, were placed under a very dense black and white negative, and were exposed to the sun for five or six hours, and for about an equal time to diffused light.

"The result of this was unexpected and very curious. *Every* paper treated with hyposulphite had been perfectly fixed; even the one which had been but five minutes in the solution showed no sign of an image.

"On the other hand, *every piece treated with sulphocyanide showed a distinct image;* even the piece which had remained so long as half-an-hour in this very strong solution showed a perfectly plain image of the negative."

Very much more follows to the same effect. This article was copied into the *Philadelphia Photographer*, and recopied by our weekly contemporary. The English photographers were, therefore, amply informed of these decisive experiments.

So much for the testimony of a chemical expert. Now let us listen to a thoroughly practical photographer, Mr. Alfred Hughes. In an article in a contemporary, published January 4, 1867, in which he speaks favourably of sulphocyanide in the toning bath, he says:—

"I tried various experiments, but as fixing agents I found the sulphocyanides were not in any way comparable with hyposulphite of soda. In the first place, though the prints may be immersed in any strength of the solution for any length of time, yet, when washed and dried (by exposure to light), the white portions turn to a yellowish-red colour, extremely unsightly, and choking up the gradations of half-tones."

There is no need to quote further from the records of the times for proof that this salt had a fair trial and was rejected from its inefficiency. Had Mr. Hooper taken the trouble to try himself what he recommends to others—and before he read the paper he ought to have felt himself bound to do so—he would have been qualified to speak.

When the uselessness of sulphocyanide as a fixing agent was discovered it was thought to have a beneficial influence in the toning bath; but even here it has not stood the test of time, and its former advocates have abandoned it. In its more limited use as a fixer for negatives, accompanied as it is by an objectionable odour, we do not think it likely to replace the agents in use.

Sulphocyanide has been weighed in the balance and found wanting, and Mr. Hooper, in ignorantly recommending its use, is in the same position.

## ON INTENSIFICATION.

In most processes, especially in the various dry ones, it is generally a matter of impossibility to produce sufficient density for printing purposes by the first application of the developing solution. In the case of plates prepared with bromide alone the necessary thickness of deposit may be reached by the successive additions of alkali to the developer first used; but in many others, including the wet process, recourse must be had to the acid silver method. This we

may for convenience call "redevelopment," in contradistinction to "intensification," as the use of acid silver continues to deposit the metal where it is required, thus *continuing* the first development; whereas by "intensification" we understand the darkening or changing the colour of the silver deposit already formed.

Many methods have been recommended at different times for the purpose of producing the latter effect, amongst which we may mention the use of bichloride of mercury (followed by treatment with salts containing iodine, sulphur, or ammonia), Mr. M. Carey Lea's method with Schlippe's salt, and the mixture of persulphate of uranium and ferridcyanide of potassium.

The whole of these, though good enough in their way, have defects. The employment of mercury gives excellent results with care and attention; but the mercuric salts formed in the film are of such an unstable nature as in many cases to render the negative valueless after very few prints have been obtained from it.

If the mercuric treatment be followed by iodide of potassium an image is obtained varying in colour from a brilliant orange to full scarlet, according to the strength of the solutions used and the time they are allowed to act. Negatives of this colour may be made to produce excellent prints at first, but, unfortunately, under the action of light the colour of the iodide of mercury fades gradually to a pale lemon yellow. On the other hand, when sulphurous or ammoniacal salts are employed in connection with mercury, the deposit, which is of a deep brownish black, *darkens* to such an extent under the light's action as to render the negative too dense to print from. These elements of irregularity may not be of much consequence where but few prints are required from a negative, but in the case of a negative from which, probably, hundreds of prints must be made this method is placed out of court.

Mr. M. Carey Lea's process, which consists in first chlorising the image and then treating it with a solution of Schlippe's salt, is not liable to the same charge of uncertainty; but the colour produced is of so non-actinic a nature as to render this plan more suitable for negatives of engravings and similar purposes rather than for ordinary landscape or portrait work. For such work we imagine it would be useful only in the case of very thin, flat negatives which could not be worked up with silver.

The persulphate of uranium method, which was introduced about eight years ago, combines the two defects we have already mentioned. It gives a deposit of a deep reddish brown, very non-actinic when newly formed, but which changes colour rapidly, when exposed to the light, in an apparently arbitrary manner—sometimes fading, sometimes becoming denser. In addition to this, very slight variation in the proportions of the two salts or in the strength of the solution used destroys any hope of uniformity in the results obtained.

As a general rule the three methods we have spoken of refuse to act satisfactorily upon alkali-developed bromide images, in some cases producing no effect at all. This is the less to be regretted from the fact that with bromide plates at the present day there is seldom any trouble in producing the requisite amount of density without recourse to silver redevelopment; and even in the case of engravings or other pictures without half-tone, where very great intensity is required, the object may be easily attained by the use of acid silver.

There are cases, however, when, in consequence of errors in exposure or development or from various other causes, an image is obtained of such a nature as to be perfectly useless for printing purposes, and which obstinately refuses to gather density under the action of silver. Take, for instance, the thin, greenish, transparent deposit formed by the use of too much ammonia. In such a case, in the lights, the silver bromide is reduced throughout the whole thickness of the film, but is in such a state as to be little denser than the unchanged portions. The method we are about to describe will change this thin, valueless image to one of printing density, and can be used for the purpose of very slight reinforcement or for the production of the greatest density possible, as may be required. This result is produced without any risk of fogging the negative or filling up the detail, and the resulting image, being formed of metallic silver, is as permanent as an ordinary silver-developed one.

The first step in the process we are about to describe consists in the conversion of the developed and fixed image into chloride of silver. This is done by means of a solution of chloride of copper. This salt has been previously recommended for various purposes in photography, and, possibly, even as a means of converting the image in this manner; but the subsequent steps in this method we do not remember to have seen described before.

The strength of the solution of chloride of copper is not of much importance, but let it be such as to produce the required effect in about half-a-minute. The colour of the image after treatment with the copper solution is not perfectly white, but has a tinge, more or less marked, of pinkish brown.

After washing thoroughly the plate is ready for the next treatment, which consists in flooding it with the ordinary alkaline developer. No exposure to light is necessary, on account of the facility with which alkaline pyro. reduces the silver chloride. If the negative require but slight reinforcement it is better to use a little bromide and proceed as in the ordinary development, stopping the process when the right point is reached. If, on the contrary, great increase of density be necessary apply at once a very strongly alkaline solution without bromide, taking care to send it over the plate in one even wave. The plate is again thoroughly washed, and if very great intensity be required the application of the acid silver developer will produce any thickness of deposit desired. The colour of the deposit thus obtained is of a very non-actinic nature, the negatives printing denser than they look.

If through careless washing brown stains make their appearance in the film a wash with dilute acetic acid will remove them. If the acid be used too strong the image will be liable to injury; probably twenty drops of glacial acid in one ounce of water will be found sufficient.

Another application of this method is for the toning of transparencies. Any colour by transmitted light may be produced from a warm brown to neutral black, while the surface colour is always nearly black.

## RECORDING MAGNETIC PHENOMENA.

A brief article by Mr. Horseman Kirkby, in another page, respecting the registration, by means of photography, of certain phenomena in connection with magnetism, will doubtless be appreciated by those who are interested in recording phenomena of this character. Iron filings are strewed upon a sensitive dry plate, and these, under the influence of magnets, arrange themselves in definite patterns, when, by exposing the plate to the action of light and applying a developer, these patterns become fixed. From the negative thus prepared prints were obtained in the usual way. Of these prints we have received specimens.

Last winter we prepared several negatives similar to those made by Mr. Kirkby, and, as the method we adopted is somewhat simpler than that gentleman's, we briefly describe it:—

A plate of glass is coated with paraffine; this is easily done by applying heat and then rubbing the surface with wax. When it has become cool iron filings are strewed over the coated surface, and one or more magnets are applied underneath so as to cause the filings to arrange themselves in definite forms. The magnets are then withdrawn and the plate made warm by the flame of a spirit lamp, by which the paraffine film is melted and the metallic particles retained *in situ*. The plate thus prepared may be at once used as a negative, although if several prints be required it is necessary that a coating of varnish be applied. The kind of varnish to be used must, we need scarcely observe, be one that has no solvent action upon the paraffine film.

## SPIRIT PHOTOGRAPHY UNDER A CLOUD.

Some remarks that have appeared in this Journal concerning M. Buguet—a Parisian photographer who, it was alleged, obtained "genuine" spirit photographs—have brought down upon the heads of the Editors no small amount of animadversion. Was not the genuineness, it was asked, of the spiritual origin of the Buguet

photographs attested by Mr. W. H. Harrison, a whilom contributor to this Journal, and the present editor of the *Spiritualist?* and did not a whole host of *dilettanti*, including the names of some who stand very high in science, say it was all correct? and were not the uncles, aunts, grandfathers, grandmothers, and other relatives of several of the sitters recognised in these spirit photographs? All this, we admit, is quite true. Yet, because we ventured some time ago to merely hint a doubt respecting the occurrence of such marvels, we have received sundry lectures, various hints, and, in one or two cases, the "cold shoulder" from some respected friends under whose eyes our comments fell. But all the while we never said that M. Buguet—who took much English gold away from London and left a goodly number of photographs of deceased persons behind —was an impostor. We never even hinted so much; we only indicated a simple test that would have been applied had we been invited to be present in a tentative capacity.

But "time changes a' things." Although it is not many months since M. Buguet left this country accompanied with such honour as the spiritual periodicals could pay him, and with the pecuniary gleanings already indicated, one journalist, Mr. Harrison, now writes—"M. Buguet has turned out to be a thorough scoundrel. He has made a confession in which he asserts that he has *never taken any genuine spirit photographs.*" This statement, be it observed, is simply a quotation. But what, it will be asked, has given rise to such a great change in spiritualistic opinion? By the aid of the *Medium*, the *Spiritualist*, and the Parisian gossip to which we have had access we will tell the story.

M. Buguet, of Paris, a spirit photographer, came to London early last summer, and, after advertising in this Journal for premises, he obtained them, where he received many visitors and sitters. When he arrived we had an interview with this then famous French spiritualist; but, owing to some misunderstanding, *that* interview was the first and last. We were certainly desirous of being present at what may be designated a "test" *seance*, the only stipulation being that our own camera, with its binocular lenses, should be used. The "spirits," we knew, had previously expressed in some shape or other their dislike of a binocular camera. In one instance the stereoscopic lenses were said by the operator to be too slow, although we knew them to be more rapid than that by which the "genuine" pictures were taken; in another, the foci of the twin lenses were found not to be absolutely similar, and soforth. We have been many times present when spirit photographs were about to be, or were being, taken, but in no one case yet have we seen spirit or abnormal forms produced under such circumstances as would warrant us in inviting the scrutiny of a discriminating "outsider" to such report as we would have to give. In short, we have as yet received no evidence that spirit photographs can be taken. We may, in reply, be referred to a statement in the recently-issued work of Mr. Alfred Wallace, in which the contrary is implied; but to this we, in return, refer the reader to a brief notice of that work which will appear shortly.

The story of M. Buguet, as it stood at the close of last week, is a somewhat unpleasant one, and if we are in the slightest particular incorrect we shall most willingly afford the requisite space to any person desirous of setting us right. Returning to Paris from this country, and laden with what were the equivalents of testimonials from men of note—fellows of the Royal Society, lecturers in University College, editors, and simple commoners—M. Buguet practised "spirit photography" with renewed zeal in that gay capital. Parisian policemen seem to have been materialistic to an unusual extent; they wished to know more about this kind of practice. One fine morning two of the "force"—one of them an inspector, the other a photographer —called upon M. Buguet to have a spirit photograph taken. Waiting till the dark slide with its sensitive plate was about to be inserted in the camera, they produced their warrant, had a developer applied to the as yet *unexposed* plate, and saw a "spirit" developed. A search was then made, the originals of this and other spirit forms were discovered, and the ingenious photographer was subsequently lodged in "durance vile," from which, after confessing that he was an impostor, he was liberated on bail. Of course there will be a trial, for he has involved two others besides himself, one of them being an editor; and as he (M. Buguet) is expected to play the part of what in this country is designated an "informer," some queer revelations will doubtless be made.

In the meantime spirit photography has still many true believers in London; and, although the editor of one of the weekly periodicals devoted to this topic denounces Buguet as a "thorough scoundrel," that of the other looks upon him as a kind of Galileo, who has made a confession he knows to be untrue in order to be released from prison, quite overlooking the fact of the seizure by the police of the tools and implements by which the trade in the so-called "spirit photographs" was carried on.

It is said, however, that many of the "spirits" evoked by M. Buguet have been recognised. Far be it from us to say that they have not; but we do not travel beyond our own experience in such matters when we assert that a muslin mask fastened upon the face of a courageous "medium" has been recognised by a person of more than average intellectual powers as a deceased relative; and that in a deposition of silver on the back of a wet collodion plate, caused by contact with our own fingers, the bearer of a name well known in spiritualistic circles has recognised a visible "manifestation" fraught with much interest. Surely, one might say, if spirit photography be the incontestible fact some people say it is, there ought not to be much difficulty in convincing the world of the reality of such fact, and this opinion we endorse.

## PATENTS *VERSUS* REGISTRATION.

To the late Mr. Thomas Webster, Q.C., F.R.S., who died suddenly on Thursday, the 3rd instant, photographers are largely indebted for sound information respecting patent law and registration and what constitutes the difference between the subjects fitted for one and the other.

To what extent we have been indebted, directly or indirectly, to the deceased gentleman as regards specific items of advice on such matters, imparted through the medium of our "Answers to Correspondents'" column, we cannot easily say. Until his clear exposition on the distinction between a subject proper for protection by registration on the one hand, or by patent on the other, had been published—as was the case in our pages about eleven years ago—photographic inventors were liable to make grave blunders, and to seek protection for minor inventions under a shield which could be set aside by the first adverse legal judgment. As a fitting *souvenir* of the departed patent lawyer we shall present from our note-book a few home truths in connection with patents gleaned from the *viva voce* utterances of that eminent counsel.

Anything that consists of a combination of parts is a subject for a patent, not one for registration. To adduce an example:—Mr. Ottewill *registered* a certain description of camera which at the time of its introduction was considered very ingenious indeed. It was a compound box, or rather a box sliding into a jacket, both box and jacket being hinged in such a way as to permit them to be folded down and assume a flat shape. Ottewill's "registered" camera was indeed well known at one time. In testing the value of the protection afforded by registration in such a case, Mr. Webster's short and easy mode of proceeding would be as follows:—*Q.* Can you trace the features you have registered on a piece of paper? *A.* No; it is not a mere design, but consists of parts adapted to each other. To which the reply would be, and we heard it made in *another* case, and took it down in shorthand—"Your camera is very ingenious. Not for a moment would I deny it; but you have made a slight mistake. Your camera has a combination of parts; the Designs' Acts, under which it was registered, have for their object the securing to artists and makers of patterns a beneficial interest in the results of their talent and ability, so as to give them protection for particular designs, which are things essentially dependent on shape and configuration. A design is, of necessity, a thing which can be shown on paper in two dimensions, such as the pattern on a piece of paper-hanging or carpet, or anything of that sort that can be shown in outline; but when you have a mechanical arrangement you get a combination of parts—

a thing in which the novelty in no respect is comprised in its shape or configuration, and therefore something that cannot be registered. You may draw a design on a piece of paper and register it; but the moment you begin to combine parts it ceases to come under the ægis of the Designs' Act."

Language like this, although applied to quite another case than the hypothetical one of Ottewill's camera, we have really heard Mr. Webster employ in public, and with such effect that the case was immediately decided in his favour. If, therefore, a photographer be so fortunate as to make an invention or discovery which he does not feel quite at liberty to present to the public without some adequate remuneration, and yet be of opinion that it will scarcely pay to incur the expense of a patent, he must not imagine that there is an intermediate course—a kind of registration—that will give him a monopoly for three years without his having to bear the expense incident to obtaining a patent; let him be warned in time that registration does not apply to any piece of mechanism whatever—neither to lenses, cameras, stands, or other apparatus, all of which *must* be protected by patent.

Registration is a cheap mode of securing protection, and within legitimate limits it is a good method; but unless wisely entered into it may prove but a policy which is in imitation of the instinct of the ostrich, who by hiding its head under sand believes that its whole body is thereby shaded from public vision.

To conclude: if any reader have conceived a choice design which he is desirous of securing to himself, then let him *register* that design, if he consider it to be one worthy of protection and one which, in consequence of time or labour invested, he cannot afford to *present* to the public; but if it be a subject in which a combination of parts is involved then let him secure it by patent. Registration in such a case will be thrown away. Let the reader calmly cogitate over the difference between mere outline and a combination of parts; for in this lies the difference between the successful holding of protection by patent and registration.

## ON A STANDARD MEASUREMENT OF ACTINISM.

From the report of a meeting of the Edinburgh Photographic Society which appears in another column it will be seen that Mr. Turnbull, in recommending the use of an actinometer as an aid to exposure in landscape photography, suggests the introduction and adoption of some standard by which the quantity of actinism present in ordinary light could be readily ascertained. It is a well-known fact that the more perfect our knowledge of any particular branch of science becomes, and the more widely the practice of it extends, the greater the necessity for refinement in manipulation and exactness in observation, and especially for the power of unmistakably communicating the results of both to co-labourers in other parts of this country or in other countries.

In the domain of experimental physics this necessity was early recognised, and has, in a large number of cases, been very satisfactorily supplied. The *foot pound* gives a convenient measure of the amount of force or energy developed under any particular series of circumstances; the *ohmad* presents a universally-applicable unit of resistance in electrical science; and there are many other equally valuable technicalities in constant use among scientists, as is well known to our readers, whereby study is promoted and intercommunication simplified. Probably one of the best examples of the benefit to be derived from the united action of observers generally is to be found in the recommendation of the Microscopical Society that the screws of all the object-glasses of our best makers should be of the same size and number of threads. The value of the recommendation was at once recognised, and the result is, as is generally known, that a standard size has been almost universally adopted, in consequence of which microscopists can supply themselves with the lenses of any particular maker without being put to the cost and inconvenience of adapters or any other appliances.

Now that which was found so necessary and has proved so valuable in experimental physics is certainly equally necessary and would prove equally useful in the practice of photography. From the nature of things the experimentalists to whom we look for the explanation of much that is still unknown are isolated workers, and it will be evident that, so long as they have a difficulty in freely and plainly communicating *all* the conditions under which their experiments are made, very much of the benefit of those labours will be lost to those who are most interested in them. It is, no doubt, true that during recent years several advances have been made in this direction. It is becoming the practice with some opticians to discard the once common method of marking the stops of their lenses, "one," "two," "three," and so on, and to state on each stop, instead, its relation to the focal length of the lens. This is of itself an immense improvement, enabling, as we recently showed, anyone acquainted with the matter to repeat exactly the experiments under precisely similar conditions so far as the optical arrangements are concerned.

Valuable, however, as this improvement undoubtedly is, we shall not be able to carry it out to its fullest extent till we have agreed on some method of estimating the amount of actinism actually present on any particular occasion, and so be able to report, not only on the power of the tool used, but also the exact quantity of material—or, rather, we should, perhaps, say *immaterial*—on which it was made to work. For this purpose the expressions now generally employed—such as "bright sunshine," "very dull," &c., with various qualifying adjectives between—if not misleading, certainly convey, so far as exact work is concerned, very little useful information. We are aware, of course, that there are many cases in which artificial light can be and is frequently employed. Under such circumstances it is possible by photometrical examination to ascertain and convey to others an exact knowledge of the amount of the illuminating power of the light employed; but, practically, that is little better than useless information, what is required being a means of estimating the power of any given light to decompose a compound that is sensitive to its influence—the power, in fact, to say, as was suggested at the meeting already mentioned, that any particular experiment was made with light of a certain number of degrees of actinism.

The necessity for such an arrangement admitted, we do not think there is any insurmountable difficulty in carrying it out. An actinometer, such as that issued by the Autotype Company, might be made to answer the purpose, provided a uniform standard paper and tint could be produced. We believe that the variation in the sensitiveness of various samples of paper depends mainly on the sizing and coating material; and, as chloride of silver is a constant compound, we have no doubt that a paper made from white linen rags requiring no bleaching and sized with the ordinary resin size would be found to answer the purpose. Such a paper, we are aware, when sensitised in a bath containing a large quantity of citric acid, will keep good for at least four years, and probably indefinitely, and we do not think that its sensitiveness would be found to vary. The best proportions and most suitable acid could easily be ascertained by a series of experiments; and when these were once fixed the paper could be exposed till a suitable colour was obtained, and then there would be no difficulty in producing the standard "tint" by staining or otherwise. A standard paper and tint thus obtained, the only other thing required would be to fix on a standard method of communication—a system of reading, in fact, that should be universally understood; and this we also consider a simple matter. It has been suggested that the actinometer might be exposed to the light of a very brilliant actinic day, and the time required to produce the standard tint carefully noted, then afterwards exposed in like manner on a very dull day, and the time also taken; and if the difference between the two were divided into portions of ten seconds or a minute, or whatever divisions might be found most convenient, each of such sections might be called "one degree." Of course it will be evident that in this way the weaker the light the greater would be the number of degrees by which it would be represented; but, if that should be considered offensive to our ordinary ideas of nomenclature, it would be quite easy to apply an inverse ratio, and call the short exposure the higher, and the long one the lower.

In our next number we shall give an account of a new and excellent actinometer, just introduced, and which, we believe, will prove to be an improvement on any other form previously made. It will be illustrated by a diagram.

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As we anticipated, Mr. M. Carey Lea has been able to vindicate fully the correctness of his calculations in connection with his chloriodo-bromide emulsion formula, and also to reply to some of Mr. Stillman's other strictures upon that process. The matter has been already so fully ventilated in our columns that few remarks are necessary on our part to enable our readers to form a correct judgment on the state of the case. One point, however, we must call attention to, and that is the great variation in the strength of the acids employed by different operators. This is not of vital importance where a large excess of silver is used—say four or five grains; but it points to the necessity of paying greater attention to even the most simple details. The acid employed by Mr. Lea—two drops of which will neutralise one grain and a-half of silver—is weaker than that used by Mr. Stillman, while that used by ourselves, and spoken of in our article of May 28 (page 254), is still stronger. It will be noticed that not only do we use acids of higher specific gravity, but in mixing them *by weight*, instead of by volume, the actual proportion of hydrochloric acid is increased to nearly two and a-half to one, in place of two to one as usually employed. We must here direct attention to an error in the article above referred to, which we only discovered on going over Mr. Lea's calculations in comparison with our own. The quantity of *aqua regia* of the strength spoken of we are in the habit of employing is one drop to each ounce of emulsion, the amount of silver reduced by which is 1·881 grain, though through oversight we spoke of that quantity as the equivalent of *two* drops of acid. We notice that Mr. Lea treats the cupric chloride as being pure—that is to say, containing no adulteration and but two equivalents of water. Since writing our previous article we have analysed two new samples of commercial chloride, both of which contained a considerable quantity of impurity such as we spoke of previously. This leads us to imagine that the pure salt is difficult to find except in the laboratory of the chemist; and it would, therefore, be wise to find by actual experiment the quantity of silver necessary, or else to purify and dehydrate it before use. As regards the latter part of Mr. Lea's communication, we have no doubt that Mr. Stillman has by this time convinced himself by experiment that his original views are untenable. Should his not be so, however, we trust that Mr. Lea's explanation will be sufficient to prove to Mr. Stillman that he has erred in charging the former gentleman with carelessness and miscalculations. Mr. Lea has certainly earned the gratitude of dry-plate workers by his openness in publishing what he discovers; and, knowing Mr. Stillman to be one of our highest authorities on emulsion matters, we should be happy to see these two gentlemen work together to produce a really perfect emulsion.

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## THE CHLORIODO-BROMIDE PROCESS AND MR. STILLMAN.

READ with a strong feeling of regret the article which Mr. Stillman has published on the subject of the chloriodo-bromide process. If his objections were well taken the case would be different; but his criticisms are neither just nor reasonable, as I shall be able easily to show. Admitting, as Mr. Stillman does, that at the time of writing he had not made a single experimental trial, he nevertheless unsparingly condemns the process on theoretical grounds—if, indeed, that term can be applied to a series of conjectures and mistakes.

The first and principal objection made to my formula is that it involves an excess of bromides—that the quantity of silver nitrate is less than equivalent to the haloids. Long before this article can reach its destination Mr. Stillman will probably have become himself aware of at least part of the mistakes on which his conclusion is based. His "analysis" of my formula is made up of five calculations. Of these *four are altogether wrong*—two by reason of mistakes in equivalents, and two by reason of errors in arithmetical computations—computations, too, of a very simple sort.

Mr. Stillman says—"I must confess I do not understand Mr. Lea's table of equivalents." This much may, I think, be granted. "According to my chemistry," he continues, "this formula will convert as follows:—

| | | | | | |
|---|---|---|---|---|---|
| "8 grains | Cd. Br. *('dried')* | (at. wt. 136·) | ..10· | grains silver nitrate. | |
| $2\frac{1}{2}$ ,, | Am. Br. | ( ,, 98·) | .. 4·336 | ,, ,, ,, | |
| 2 ,, | Am. Iod. | ( ,, 145·) | .. 4·343 | ,, ,, ,, | |
| $1\frac{1}{3}$ minim | H Cl. | ( ,, 36·5) | .. 2·487 | ,, ,, ,, | |
| 2 minims | Cup. Cl. | ( ,, 68·2) | .. 5· | ,, ,, ,, | |
| | | | 26·166 | ,, ,, ,, | |

Having made the above computation Mr. Stillman deduces from it a deficiency of 1·166 grains of silver nitrate when twenty-five grains of that substance are employed. I shall analyse these calculations *seriatim*, reversing the order.

*Cupric Chloride*—(The "minims" are here evidently a mistake for grains).—This substance is found in commerce invariably in the hydrated state, as is sufficiently indicated by its *green* colour. The anhydrous salt, occasionally prepared by chemists, but not known in trade, is *brown*. The well-known commercial salt contains two equivalents of water, a fact of which Mr. Stillman does not appear to have been aware, and which equivalents are omitted in his calculation. Cupric chloride has an equivalent of 85·5, not 68·2, as stated by Mr. Stillman, whose number (68·2) is also otherwise erroneous. Two grains of cupric chloride *correspond, therefore, to* 3·976 *grains of silver nitrate, and not to five grains, as calculated by Mr. Stillman.*

*Aqua Regia.*—Some years ago I determined the quantity of silver nitrate precipitated by *aqua regia*, such as I use, by actual experiment, and found it to be approximately a grain and a-half for each two drops of *aqua regia*. Mr. Stillman sets it down at 2·487 grains. As to how he arrives at this result he does not give one word of information, and he subsequently qualifies *(without correcting in the table)* this estimate by remarking that if "common" hydrochloric acid be used in the *aqua regia* the result would be materially reduced. Can Mr. Stillman think it a right basis for calculation to take an acid of unusual strength, and different from what I and others use, in order to swell the amount of silver nitrate and put me apparently in the wrong? I might reasonably substitute my own value for *aqua regia;* but, to make the case stronger, I shall take Mr. Stillman's data, viz., acid of twenty-eight per cent., and disregard, as he does, the specific gravity. Two minims of *aqua regia*, containing one and a-third minim of twenty-eight per cent. acid are calculated thus:—$1\frac{1}{3}$, multiplied by $\frac{28}{100}$, and again by $\frac{170}{36 \cdot 5}$, *gives* 1·738 *grains of silver nitrate, instead of* 2·487, *calculated by Mr. Stillman.*

*Ammonium Iodide.*—The mistake here is in the arithmetic, and it is the more singular that it should occur as the calculation is of the simplest sort. The equivalent of silver nitrate, 170, divided by that of ammonium iodide, 145, gives 1·173 grains of silver nitrate as corresponding to each grain of ammonium iodide, and, consequently, the two grains will require 2·346 grains of silver nitrate. How Mr. Stillman could find 4,343 as the result of dividing 145 into twice 170 I am unable even to conjecture.

*Cadmium Bromide.*—This case is, perhaps, the worst of all, for Mr. Stillman, whilst admitting that he knows what I mean by "dried cadmium bromide," insists that he will take my figures as meaning anhydrous. This is really a little too much. He might just as well say that when I write cadmium bromide he will understand sodium hyposulphite, and reason accordingly. I had shown in a very clear way that when cadmium bromide was dried it lost in drying only one-half its water, and that the rest could only be driven off at a temperature very much beyond that of boiling water. I therefore distinguished between "dried" and "anhydrous" cadmium bromide, and to prevent the possibility of any misunderstanding I placed an asterisk to the word "dried" in the formula, with a footnote referring to the passage in which the dried cadmium bromide was carefully defined. Therefore, I say with regret, the mis-statement here can hardly be unintentional. *Eight grains of dried cadmium bromide are equivalent to* 8·832 *grains of silver nitrate, and not to ten grains, as stated by Mr. Stillman.*

I think I am entitled here to ask if any one is excusable in placing before the public such crude work as this, or in making it the basis of a criticism intended to argue errors where none exist? Fresenius, in his introduction to *Chemical Analysis*, says emphatically to his students:—Analyse as much as you please, but *publish nothing that you cannot swear to.* Otherwise, in place of advancing science, *you are making work for somebody else in correcting your mistakes.* The advice is admirable; loose calculations and random assertions are the bane of scientific progress. An instance more to the point than

the foregoing could not easily be found. The corrected calculation is therefore:—

| | | | |
|---|---|---|---|
| 8 grains Cd. Br. + 2 HO | equivalent to... | 8·832 | grains silver nitrate. |
| 2½ „ Am. Br. ......... | „ ... | 4 336 | „ „ „ |
| 2 „ Am. I. ............ | „ ... | 2·346 | „ „ „ |
| 1⅓ minim H Cl. ............ | „ ... | 1·738 | „ „ „ |
| 2 grains Cu. Cl. + 2 HO | „ ... | 3·976 | „ „ „ |
| | | 21·228 | „ „ „ |

*In place, therefore, of the silver nitrate being deficient by* 1·166 *grains, it is in excess by nearly four grains.* This is using Mr. Stillman's figures for hydrochloric acid. If I used my own computation* the excess of silver nitrate would be *over four grains.* The errors in Mr. Stillman's computations—partly depending upon mistakes in equivalents, and partly upon arithmetical errors—amount to about *five* grains. In one case—that of ammonium iodide—the over-statement amounts to between eighty and ninety per cent.! It is a little singular that all these mistakes should be *concurrent* in their character—that they should all tend one way, namely, to exaggerate the quantity of silver nitrate required, and by their united effect to carry it apparently beyond the quantity called for by my formula.

The objections in the rest of the communication are even less to the purpose than the foregoing. Mr. Stillman thinks it useless to apply to the partly-dried emulsions such substances as albumen, gum, or sugar, because they are subsequently to be washed out, and because they are insoluble in alcohol and ether. Almost everyone is aware that silver bromide, iodide, and chloride are largely influenced by contact with many sorts of organic matter, and that the effect once produced the organic substances may be removed without removing that effect. As I clearly pointed out, one of the great merits of the new method is that when the desired sensitiveness has been imparted to the silver haloids the sensitising substance, or so-called preservative, is washed out, and thus *the main cause of spontaneous deterioration of dry plates is removed.* A further proof (if any were needed) of the marked influence of these agents lies in the fact that gallic acid used with gum gives a totally different emulsion from that produced by gallic acid with coffee. The one gives plates that solarise very readily; the other plates that have unusual latitude of exposure. It seems, however, a mere waste of time to answer an argument which ignores facts universally known. My principal difficulty in replying to Mr. Stillman lies in the apparent impossibility of taking his reasoning seriously.

There is, however, one matter of a graver sort. Mr. Stillman says of me:—"In his directions in THE BRITISH JOURNAL OF PHOTOGRAPHY, March 12, he says naïvely that if the 'fibrinous matter' be allowed to settle the filtration is facilitated, which is very natural, since this fibrinous matter is *albumen coagulated by the tannic acid,*" &c. The passage referred to will be found in the footnote. It is easily identified, because it is the only place in the article in which I have used the expression "fibrinous matter," put by Mr. Stillman between quotation marks. It is as follows:—"Using our 'No. 8,' which, I believe, corresponds with the English 'Beaufoy's' (acetic acid), I add twenty-five minims to each fluid ounce of white of egg, and an equal bulk of water to that of the egg. The mixture is then to be shaken in a stout bottle with bits of glass, and to be *filtered* through sponge. It greatly facilitates the filtration to let the *fibrinous matter* settle before filtering," &c.

*Not one word about tannin.* The directions are simply for preparing a dilute albumen with white of egg, acetic acid, and water. *Tannin* is not mentioned. Mr. Stillman has transferred my remarks relative to one matter and applied them to another—from a formula for dilute albumen to directions for making a preservative of tannin, &c.—in order to make it appear that I have made an absurd mistake, and has used inverted commas in order to make the quotation more pointed. Is it possible that Mr. Stillman can consider this sort of thing legitimate?

I believe Mr. Stillman to be a better experimentalist than calculator or critic. He has worked much, and I do not doubt that he has obtained useful results from his study of emulsions; indeed he has frequently in these columns referred to such discoveries. But if he has made them he has not published them. He has stated in a general way that he has found the means of doing this or that, but he omits to say how he has done it in any clear or definite manner, such as would permit of verification or use.

* The equivalent of *aqua regia* for silver nitrate, calculated, will always exceed that found by actual experiment, for the reason that *aqua regia* rapidly loses chlorine. Experiment is here evidently the true criterion. We wish to know the behaviour of the materials which we have in use, and not what would be that behaviour under different conditions. The loss of chlorine takes place even in well-stoppered bottles. In this way is explained the difference between the calculated equivalent of *aqua regia* and that found in practice.—M. C. L.

The advantage which emulsion work might have derived from Mr. Stillman's labours it has lost through his reticence. He affirms that he can produce by methods of his own (which he has not published) results as good as those yielded by mine (which he has not tried). He says that he does not use any of my methods. But, at least, I have given him the opportunity of using them. Can *he* say as much? Has *he* given anyone the opportunity of using his methods? I cannot recal a single instance where he has given any information sufficiently definite to enable a reader to repeat his work. Everything is general and indefinite.

It has been a most painful task to me to set this matter right. I have never had any but friendly feelings towards Mr. Stillman, and am confident that I have never done him even the most trivial injustice. His animadversions have been wholly unprovoked, and are so completely groundless that it is a matter of surprise to me that they should have been seriously brought forward. M. CAREY LEA.

## MAGNETIC PHOTOGRAPHS.

[A communication to the Liverpool Amateur Photographic Association.]

THESE photographs show the lines of direction and the field of magnetic influence between the poles of horseshoe magnets. The negatives were obtained in the following manner:—

In photograph No. 1 four magnets were laid on a table, their poles forming a square, every N. pole having a S. pole for its immediate neighbour. On this was laid a dry plate, face upwards, and fine iron filings dusted on. Under the influence of the magnets the filings arrange themselves in a definite pattern, and this is facilitated by giving the plate a gentle tap. All these operations were conducted by candlelight. The gas was then turned on for three minutes, and the plate afterwards developed in the usual way, the filings having been first carefully dusted away.

The second photograph was with the poles arranged so that the N. pole of each magnet was next to the N. pole of its neighbour.

The third was a combination of the two preceding figures.

The fourth was with the poles forming a triangle.

The idea of using photography for this purpose struck me when lately witnessing some experiments by Mr. Philip Braham, of Bath, who expressed his regret that he had no handy means of recording the figures he met with in his investigations on magnetism, and I then and there experimented as above, and these are the results.

W. HORSEMAN KIRKBY.

## A SUBSTITUTE FOR GROUND GLASS IN THE CAMERA.—THE USE OF THE ACTINOMETER IN LANDSCAPE PHOTOGRAPHY.—AN IMPROVED PORTABLE SPIRIT LAMP.—A USEFUL GLASS CLIP.

[A communication to the Edinburgh Photographic Society.]

As it is now the beginning of the summer season, when landscape photography is most practised, I would like to embody in the following notes something that may be useful to those who shoulder the camera.

It has, no doubt, been the lot of many who practie landscape photography, when taking a trip miles away from home, suddenly to discover that he had left some little part of his apparatus at home or had forgot some necessary chemical, or that some little thing broke or gave way with him, which either stopped him altogether or much inconvenienced him. One of the most serious of these troubles is when, through some accident or another, the focussing-glass of the camera gets broken. I know that there are various ways in which a glass so broken might be replaced. A new piece of glass of the same size might be ground, or there is a varnish which gives an imitation of ground glass. Such a varnish might be carried as part of a travelling equipment, to replace a broken glass; but, as often is the case when anything is broken, the materials to mend it are not at hand.

The remedy I propose is very simple, all that is needed being a piece of flat glass of a size to suit the camera, and a piece of glazier's putty. I well recollect, when working many years ago in a very out-of-the-way part of the country where photographic *matériel* of any kind could not be obtained, an accident occurred to my focussing-glass, which was a detached one—the wind blew it from the top of the camera, where it was lying during an exposure, on to the ground, and smashed it in pieces. After vainly endeavouring to patch it up with narrow strips of albumenised paper I resolved to replace it. I went to the nearest village and "interviewed" the village joiner, who was also the glazier; the broken glass was taken out, a piece of best window glass was cut to the size, a piece of putty rolled over it, and the focussing-glass was a much better one than the one broken.

While writing this an incident which occurred at the same time comes to my recollection. At the house where I was staying the best place I could get as a temporary dark room was where the household supply of coal was kept. I had it darkened, and it served the purpose very well; a table was placed on top of the coals, on which I laid my bath and other things. On returning from exposing a plate I was met by one of the women with my bath in her hands. She explained that, having gone for some coals, in the dark she had taken a piece supporting one of the legs of the table, which, toppling over, upset the bath. She, however, naïvely remarked—"I don't think you have lost any, as it was only spilled on the table, and I gathered it all into the dish with my hands!" On examination I found that the bulk of the bath was rather augmented than diminished from a mixed accumulation of spilled iron developer, pyrogallic, cyanide, and dirty water from previous plates which lay on the table. As I had no more silver with me, and was a good many miles from where I could procure any, I thought I was entirely "shut up." However, I emptied the bath solution into a bottle, placed it in the sun, and the next day filtered it. On trying a plate I found, to my surprise, that the plate worked as well as ever, though it must have been much weaker. I also noticed that it had precipitated a good deal of iodide, with which the bath had been previously saturated from overwork. I am not troubled with over-iodised baths; but I think it would be worth a trial (though I have never tried it) to add a little plain iron solution to a disordered bath, which, though it would precipitate some of the silver, would also carry down iodide with it.

But to return to the focussing-glass. This method of treating glass answers exceedingly well, and the deposit is finer and much more transparent than most samples of ground glass. For large cameras used for enlargement it is much superior to ground glass, as the image is much better seen and can be more easily focussed. It is also much cheaper than ground glass, there being only the cost of a piece of plain glass; the price of the putty cannot be counted as anything. There is, however, a little method in applying the putty properly to get an even surface; a small piece of the putty may be taken and daubed on the glass, but that does not do so well. I have found that the best way to apply it is to place the piece of glass on a table; take a piece of putty of the size of a small potato and roll it with a circular motion over the glass with the palm of the hand, the putty being kept at the same time in the shape of a ball. I have here two pieces of glass to show you "how it is done."

### The Use of the Actinometer for Landscape Photography.

Notwithstanding the very extensive practice of dry-plate work it is nevertheless a fact that the largest amount of failures and bad work arises not from any defect in the process used, or the preparation of the plates, but from an insufficient exposure. Either too much or too little is given, from which cause, notwithstanding the great latitude in exposure allowable in most dry plates, the picture is very often spoiled in the subsequent development. The actinic power of light in this climate is exceedingly variable; one minute's exposure of a plate might give a picture which was much over-exposed, while, on the same day, five minutes' exposure might be given to another plate only to find it very much under-exposed. The laws which govern the actinic force of light have been very little inquired into, and are very imperfectly understood. The generally-received opinion is that the actinic power is greater in summer than in winter; that it is more powerful in the early months of summer than in the later. It is also more powerful in the early hours of the day than in the afternoon; and if I were asked to name a time when it would be at its maximum I should say some bright morning in May, June, or July. I have also noticed that it is not on what might be thought the brightest or most sunny days that the actinic force is greatest, but that it is greatest on days which are rather inclined to be cloudy, and when there is a certain amount of moisture in the air. I also think that the quantity of ozone present in the air bears some relation to the actinic power of the light. I do not at present wish to enlarge further, but the subject presents a wide field for investigation.

The method used in exposing plates is by giving them a certain *time*, which bears no relation whatever to the actinic power to which the plate is exposed. I have often wondered if the use of a simple actinometer could not be utilised to give the proper exposure to dry plates. I have lately turned my attention to the subject, and find that it can be used to much advantage, the form of actinometer I have used being that sent out by the Autotype Company for carbon printing. I have found that it will answer very well, but it is not quite the best for the purpose, of which more presently. This actinometer takes from between three and four minutes to eight minutes or more in the shade to print up the tint on it. This exposure may be found to be just right to suit some lenses and form of development, but, should it not, it is very easily adapted to the right exposure. The way in which I use it is as follows:—If I find that it takes six minutes to print up a tint (it requires a little practice to tell when the tint is exactly up, but after a few trials I could hit the exact time to a second or two; this can be best done by holding the actinometer at a good distance from the eyes, say about a couple of feet), I ascertain that the right exposure for my plate with a certain lens and stop is three minutes; then that is the half of a tint. On going out at another time to expose my plates I expose the actinometer, print up a tint, and the half of whatever time it takes is the proper exposure for my plate. Of course this can easily be varied; the proper time for a plate may be one-fourth or one-eighth of a tint, but this ascertained once for all gives a standard by which to give the proper exposure to a plate. Different stops of course require more or less exposure; but in the lenses of all the best makers the stops are regulated that the next smaller stop requires double the exposure, so that the right exposure being once ascertained for a medium stop the others can be calculated from it.

There is only one little drawback, of which I would like to speak. I do not know whether it has been generally remarked or not, but in using this actinometer for carbon printing the actinometer tints and the exposed carbon tissue do not always correspond, more especially late in the day. A negative which at one time requires three or four tints may require at another time six or eight. I mention this objection, but I do not think it will hold good when the actinometer is used for exposing plates. I attribute this difference more to the gelatine used in making the tissue. It is exceedingly difficult to get gelatine of a uniform quality, and also to the different degree of moisture present in the tissue at the time of exposing it.

There is also another matter which requires attention in exposing plates by the actinometer, and that is where there are deep shadows in the subject to be taken. A little lengthening of the exposure is required, and where the subject is devoid of deep shadows, such as buildings, the exposure must be proportionately shortened. The use of the actinometer for exposures will be most useful for dry plates. There is not the same necessity for using it in working wet plates, because if a plate be under- or over-exposed it can be corrected in the next plate before leaving the ground, which cannot be done with dry plates. Exposures with the actinometer can be just as easily adapted to wet plates as to dry; it is just as easy to give the tenth or twelfth of a tint which a wet plate requires as to give a half or whole tint to a dry one. For example, if it take four minutes to print up a tint in the actinometer, the tenth of that is twenty-four seconds, or the twelfth is twenty seconds. But, as I have already said, there is not the same need for the actinometer in the wet process. It is, therefore, principally in the interest of dry-plate workers that I write this communication.

With regard to a suitable form of actinometer for dry-plate work I have not as yet constructed one specially, having found the Autotype Company's actinometer, used in the way of which I have spoken, answer the purpose well enough. I would recommend one constructed on the same principle with a small strip of sensitive paper, but with a series of movable tints of different depths that any one of them could be used, so that, when the proper tint to suit the process and the lens used was found, all that would be required would be to print the sensitive paper up to this tint, exposing it at the same time to the plate. There is often much discussion as to the comparative rapidity of dry plates, the comparison generally made being that the dry plate was so much less, or that it was equal to a wet plate. Now, if a standard tint and paper could be agreed upon amongst photographers, it would be very useful for comparing the rapidity of different processes, and instead of the comparison being made with a wet plate it might be stated as follows:—Standard tint actinometer exposed six minutes; plate exposed with rapid rectilinear lens, nine inches focus stop, equals twentieth focus for two minutes. The plate would then have got an exposure equal to one-third standard tint.

### Improved Spirit Lamp.

This is a very useful lamp for varnishing negatives. It packs into a very small bulk, and should form part of every photographer's equipment when travelling, as by means of it negatives of all sizes, except very large ones, may be varnished without any trouble. The principle of the lamp is not new, being merely an improvement on previously-existing ones. It consists of a small tin box, two inches in diameter, and one and a-quarter inch in height. It is fitted with a lid like an ordinary tin box; another piece of tin, with an edge on it like the lid, is made to fit neatly into the inside of the box; a round hole one and a-half inch in diameter is cut in the centre of

this, and a piece of fine wire gauze soldered to the inside of it, covering up the hole. The box is now filled up rather tightly with cotton-wool, and the lid, with the wire gauze, pressed down on the top. The box should now be filled with methylated spirit poured through the wire gauze. This gives a flame an inch and a-half in diameter. This size is not always desirable, and, as it is an advantage to have it smaller, I have two circles of tin of the same diameter as the inside of the box. The one has a hole in it an inch in diameter, and the other one of three-quarters of an inch. Any size of hole can be made, but I find these two sizes answer very well. As the inside piece with the wire gauze is pushed about an eighth of an inch below the top of the box there is room for these two "stops," as I may call them, to lie on the top, and the lid shuts up all tight. When the lamp is burning the full size, should I wish to reduce the flame—say when anything I am boiling comes to the boiling point—I simply lay on one of the stops, which reduces the flame to the same size. The lamp made a little higher, to contain more spirit, is very useful for heating a rolling-press or burnisher, or for making tea or coffee. The size I have given holds rather more than an ounce of spirit. Any tinman will make the whole affair for about sixpence or eightpence.

### A Useful Glass Clip.

This is a very useful clip, which I use for drying sensitive paper or carbon tissue. It is much better than a wooden one, and can be made by any one who can cut pieces of glass the size. Small pieces of glass are cut three inches long and half-an-inch wide, and they are also cut about one-eighth of an inch broad and half-an-inch long. A number of pieces being cut one of the small pieces is then placed with shellac or cement across the middle of the larger piece, and another large piece is put to it to form the clip; a small rubber ring is then rolled round the end till sufficient spring is given, and the clip is complete.

The sharp edge should be rubbed off the glass to keep it from cutting the ring. J. M. Turnbull.

## ENLARGING.

No. II.

Of all the papers on which developed enlargements can be made there is none so easy of manipulation as Whatman's hand-made drawing-papers. Of these the hot-pressed imperial sheets are of a thickness and have a surface peculiarly adapted to this purpose. With almost any formula in the spring-time of the year, with fair sunshine and a good solar instrument, presentable results may be obtained; but when the lime light is employed, considerable amplification required, and the operation attempted in warm weather, a curious and offensive mottling of the picture very frequently ensues.

I remember doing twenty enlargements, or thereabouts, from the selfsame negative, all of which were ruined by this defect. After producing the first of these, suspecting that my chemicals were out of order, I made a trial print on a sheet of paper 12 × 10 from a negative of standard quality kept for the purpose of such trials and amplified to but a small degree. The result was a satisfactory enlargement, proving the chemicals were not at fault. On producing a second print from the negative first employed the mottled appearance again set in. This mottled effect, which bestrewed the surface of the picture irrespective of its lights and shades, was clearly the result of some abnormal circumstance attending the enlargement of the negative in question.

Not to weary the reader with an account of the manner in which the information was arrived at, suffice it to say the cause was this:—During a long exposure the silver solution on the surface of the paper became concentrated by evaporation, and, by dissolving more of the silver iodide from the surface of the paper and then draining to a lower level, removed some of the haloid salt which had been acted on by light to a position on the paper on which no luminous image fell, and *vice versâ*, thus causing an irregular diminution in intensity of the dark parts of the print and an irregular accession of deposit in what ought to have been the lights.

I am not sure whether the conveyance of altered iodide was effected mechanically by the draining of the fluid over particles loosened by the removal of their supporting neighbours, or whether a solution of actinised silver iodide in aqueous silver nitrate is capable in itself of precipitation by development. Doubtless, the mechanical removal of actinised and undissolved silver iodide did take place; but I suspect, also, that though silver iodide when dissolved in silver nitrate is insensitive to the light, yet a solution of iodide previously impressed is capable of precipitation by development. If so, the circumstance will be one of the many causes of fogginess in the silver nitrate bath. The experiment, however, is not difficult to try, and the question may, therefore, be easily set at rest.

The remedy for the mottled appearance, its cause being known, is not difficult to find, consisting, as it obviously must, in the prevention of evaporation during exposure, or, at all events, in preventing further concentration of the solution of argentic nitrate. By saturating the atmosphere of the room in which the enlarging operation is conducted with aqueous vapour further concentration is prevented, and for some time I preferred to adopt this plan, which was effected by copiously sprinkling the floor and walls with water before the daily operations were begun. Another method, tried with good effect, was the mixture of the silver nitrate with a deliquescent salt; but I always prefer to effect such objects without the introduction of new chemicals. A third and better plan than all is the removal of the silver nitrate from the paper by a wash of water—an operation which saves the silver on the one hand, and renders mottling, whatever may be the length of the exposure, a matter of impossibility. The wash of water materially increases the rapidity of impression, but on the thinner papers detracts from the vigour of the image, which is not satisfactorily reinstated by the addition at development of an amount of silver nitrate equal to what has been removed.

Some enlargers float their paper on a bath of silver, sheet after sheet, upon the same solution. Others convert their paper for the time into a dish by folding up its sides, and pour their silver into it from a vessel into which they again return their drainings for future use upon another sheet. Both plans of working render the strength of the silver bath one of constant diminution, and both plans, also, contaminate it with organic matter from the paper, rendering the results variable and uncertain. The proper course to adopt is to measure of the fresh solution a quantity sufficient to effectually flow the sheet, returning it to a second vessel and proceeding in each case *de novo*.* D. Winstanley.

* I observe some editorial notes appended to my last communication on enlarging, to which, with any further criticisms, I will give attention at the close of the present short series of articles on the matter.—D. W.

## FOREIGN NOTES AND NEWS.

A Curious Story.—Dr. Schnauss on Dried Albumen.—Moebius' Opal Glass Portraits.—Vienna Photographic Society.—Durable Elastic Bags.—Seitz's Lichtdruck Gelatine.—New Rapid Dry Process, by M. Franck de Villecholle.—Note on the Salts of Chromium.

Dr. Hornig, of Vienna, calls attention to a curious story which is going the round of the German newspapers, and which he believes to be quite true, though, as a rule, he does not recommend such stories to be taken except *cum grano salis*. One day a lady went to a studio to have her portrait taken. There was nothing unusual about her appearance; her complexion was fair and her face so free from freckles or blemishes of any kind that the retoucher hoped to get off easily. The astonishment of the operator may be imagined when, in spite of repeated trials with chemicals which until then had given unblemished negatives, the lady's hands, face, and neck appeared completely covered with an eruption of smallpox. As all the efforts of the photographer to remove these specks in the course of the development failed, he was obliged to do his best to retouch them out. The curious part of the story is yet to come. About five days after this sitting the lady sickened of smallpox, and was ill for a long time! Dr. Hornig thinks this is merely an example of an appearance invisible to the naked eye appearing in a photograph, and that it may be analogous to those "photographs of the invisible" produced by drawing upon paper with a preparation of sulphate of quinine which are not seen on the original paper but come out quite distinctly in the reproduction. Dr. Hornig then goes on to suggest that this preparation of quinine might be turned to practical account by photographers as a means of protecting themselves against piracy. The photographic prints might have a mark put on them with quinine that would show on the reproduction; but we fear that the pirates would soon find a way of obliterating such a mark on the reproduced negative, either by retouching or stopping out, and so time and trouble would only be wasted.

In the *Photographische Archiv* Dr. Schnauss, who has lately been experimenting largely with albumen and albumenised paper, tells us that Herr Effner, of Passau, prepares dried egg albumen for photographic purposes, on a large scale, which makes a solution equal to that prepared from freshly-laid raw eggs. He also dries the yolks

in some way so that they can be used as food. But Dr. Schnauss does not claim for his friend any new way of preparing the albumen; on the contrary, he says anyone can do it by beating up the raw white of eggs and allowing it to stand in shallow pans, in an airy place, at a temperature of from 15° to 18° R., until the water evaporates. When it is quite dry the brittle, glass-like mass of albumen is easily pulverised. This powder generally dissolves easily in clean, cold, distilled water, but care must be taken to stir it in slowly, as it is apt to stick together in cakes, which are longer in dissolving than powder. If the solution should be somewhat turbid and flaky it may be beaten up to a froth and treated like fresh, raw white of egg. Dust may be removed by adding a few drops of ammonia to the dissolving water, and then passing it through good filtering-paper. The filtering will get on much faster if a current of air be introduced into the liquid to keep it in constant motion, and to prevent the particles of sediment from adhering to each other. This remark also applies to other thickish fluids, or those in which there is a difficulty in filtering the sediments or watery fluids, but not to such as evaporate easily like collodion. A current of air may be advantageously introduced into the liquid in a variety of ways, provided the filter and funnel are large enough to contain the fluid to be filtered without danger of the air-bubbles running over. For example: a small gasometer may be used, the only outlet of which is limited by a glass tube passing into the liquid, and the strength of the outflowing stream of air regulated by cocks.

The same gentleman has also an article upon the opal glass photographs which were shown by Herr Moebius, of Dresden, at a late meeting of the Berlin Photographic Society, where they were much admired. He says:—"On the whole it seems as if little in the way of real photographic portraiture, beyond the common albumen prints, will ever be naturalised in Germany; perhaps an exception may be made in favour of the beautiful and true-to-nature ferrotypes. 'True to nature,' did I say? Nowadays it is difficult indeed to say what is natural in a photograph and what negative retouch; but if an idealised portrait having a photographic origin be wished it may now be easily obtained. Such are the artistic productions of Herr Moebius, specimens of which I have recently had an opportunity of examining. They are photographs copied by means of chloride of silver collodion upon opal glass. In delicacy and transparency of tint they are equal to the finest ivory miniatures, but much larger in size than the latter. I do not know how large they can be made, as that depends entirely upon the size of glass plates obtainable."

At a meeting of the Vienna Photographic Society great interest was evinced in a paper by Professor Bauer upon toughened glass; but it is unnecessary to give any account of his paper here, as he touched upon no important points that were not treated of in the editorial article on the same subject which appeared, some weeks ago, in THE BRITISH JOURNAL OF PHOTOGRAPHY. After that a letter was read from Baron Stillfried about the appearance of the transit of Venus in Japan. This letter accompanied a series of photographs of the transit taken by the Baron.

Herr Köhler showed two elastic bags in which to keep paper. One of the bags had been kept outside all winter at a low temperature, and the other had been kept indoors at a high temperature; then both had been crushed together, but after all this hard treatment they were none the worse. Herr Angerer expressed himself well pleased with the bags in question, and remarked that the alteration of construction and the different placing of the corners was a great advantage, making a more pliable and roomier means of transporting paper than the usual arrangement.

Herr Beyersdorff called attention to a subject which has been "hanging fire" for the last ten years, viz., the steps it would be advisable to take in order to get the regulations for the sale of poisons more adapted to the requirements of the present day. He remarked that, almost without exception, every influential person, who had supported this movement at first, was now out of office, and the hopes then held out by them are still unfulfilled.

Dr. Hornig said that when he was a member of the Chamber of Commerce he brought the matter before that body without result. He thought the best thing they could do now was to remit the matter to a committee, with power to invite the co-operation of other industries affected—bronzeworkers, chemists, &c.—and then to urge upon government the necessity for a new act.

Several of the members reported on Herr Seitz's new lichtdruck gelatine. Herr Reich had obtained some very good lichtdruck results with the sample which had been given to him.

Herr Carl Haack had not tried the gelatine for lichtdruck printing; but had found it very suitable for other photographic purposes, as it had two good qualities—it dissolved easily and stiffened quickly.

Herr Joseph Leipold, of Lisbon, also sent a communication on hyalography, which was read at this meeting, and to which we shall revert next week.

In the last number of the *Moniteur* M. Ernest Lacan mentions some very rapid results obtained by M. Franck de Villechole upon dry plates prepared twenty-five days previously. The process employed is a new one, of which the latter gentleman is the author, and is supposed to consist of a modification of the tannin process. With a pair of single stereoscopic lenses of small aperture exposures of ten and six seconds were given, the former exposure proving too long, while the latter was, if anything, more than sufficient. Instantaneous results are said to be obtained in the portrait studio.

M. Cahours contributes to the *Académie des Sciences* a note on *Certain Reactions of the Salts of Chromium*, the result of researches made by M. A. Etard. The green salts, which under the influence of nitric acid change to violet only after the lapse of some time, are by some reagents converted immediately. The addition of a small quantity of nitrite of potassium to solutions of the salts of the sesquioxide changes the colour at once from green to violet-carmine, even in the cold. The carmine tint gradually disappears, giving place to a blue-violet colour similar to chrome alum. Sulphocyanide of potassium produces, more slowly, the same result. Solutions of the green salts give, with potassium salts, a grey precipitate, insoluble in ammonia, but forming with acetic acid a violet-carmine solution, differing from the previous case in not changing to blue. Arsenic acid or arseniates change the violet salts to bright green in a few seconds, the original colour not being reproduced by the action of nitrites. Nitrate of silver does not precipitate the arsenic acid from these salts. These reactions may be clearly examined by filling a rather wide test tube about three-quarters full with a weak solution of green chloride of chromium. If a small quantity of solution of nitrite of potassium be now added the colour changes to violet-carmine, and if by means of a pipette a few drops of solution of arseniate be introduced to the bottom of the tube the lower portion of the solution takes a bright green colour. The violet-carmine salts obtained by means of nitrite of potassium gives with potash a grey precipitate insoluble in ammonia, by which test it is easily distinguished from the ordinary violet-blue salts. The bright green salts obtained by means of the arseniates possess the no less characteristic property of forming with potash a precipitate insoluble in acetic acid, but forming a violet-blue solution with ammonia. These reactions are diametrically opposite to those occurring with the ordinary *dark* green salts.

# Meetings of Societies.

## LONDON PHOTOGRAPHIC SOCIETY.

THE last meeting of this Society for the session was held on Tuesday evening last, the 8th inst.,—Mr. J. Glaisher, President, occupying the chair.

Mr. George Hooper read a paper on the advantage of sulphocyanide of ammonium as an agent for fixing prints. This paper will probably appear in our next issue.

Mr. J. SPILLER, referring to the present price of sulphocyanide of ammonium, observed that if a demand sprung up for that salt it could be supplied at a very cheap rate.

In reply to a question as to whether the sulphocyanide were a better fixing agent than hyposulphite of soda,

Mr. SPILLER remarked that it was better in some respects; it seemed to dissolve out the silver more perfectly from albumen compounds than hyposulphite.

Mr. JABEZ HUGHES had had a good deal of experience with the salt in question, and about eight or ten years ago he had tried a number of experiments. He could not trust his memory with the exact details, but he and his son tested the matter very much at the time, and the final issue was the abandoning it as being inferior to the ordinary fixing process. He could not help remarking that Mr. Hooper, while recommending this salt as a fixing agent, did not appear to have tried it himself at all, and he thought that this was quite contrary to the methods usually adopted by readers of papers, who, when they brought a process before the photographic public, usually fortified themselves with experiments on the subject and illustrated their remarks with examples. He further thought that it was an abuse of the privilege of reading papers before societies for those who did so to

neglect that very necessary operation of experimenting with the special process and illustrating their remarks by their specimens.

After some further obervations from other members,

Mr. Hooper said that his object in reading the paper was to raise a discussion, as the subject had lain dormant for ten or twelve years. He was neither a chemist nor an experimentalist, but he considered it a subject worthy of being brought before the Society; and he believed that if pure sulphocyanide of ammonium could be produced at a reasonable price it would cut out hyposulphite of soda.

A vote of thanks was then accorded to Mr. Hooper for his paper, after which the Chairman intimated that a *soirèe* would be held on the 28th of October, when the exhibition would be opened, and be closed again on the 22nd of November. The proceedings then terminated.

## EDINBURGH PHOTOGRAPHIC SOCIETY.

The last meeting of the session was held in the Hall, 5, St. Andrew-square, on the evening of Wednesday, the 2nd inst.,—the President, Dr. Thomson, in the chair.

The minutes of the last ordinary and outdoor meetings were read and approved, and Messrs. William Donaldson and W. M. Bryce were admitted ordinary members.

Mr. J. M. Turnbull read a paper entitled *A Substitute for Ground Glass in the Camera; The Use of the Actinometer in Landscape Photography; An Improved Portable Spirit Lamp; and a Useful Glass Clip.* [See page 282.] He exhibited the lamp and glass slip, and showed, practically, the application of putty to the glass and the exceedingly fine surface thereby produced.

The Chairman said that the glass as prepared by Mr. Turnbull was certainly very suitable for the purpose for which it was intended. He had found that a well-made starch paste also answered admirably, and if protected by a coat of varnish it would last indefinitely. With reference to the observations of Mr. Turnbull regarding the use of an actinometer, he thought that in some cases it might be of use, but there were very many conditions in which it could not be available. In many cases —probably in most cases—the object photographed and the camera were in different positions relative to the light, and the actinometer could then only mislead. If the camera were in the shade and the landscape brilliantly illuminated, or if, as in the case of taking an avenue, the camera were in bright light while only the most feeble rays were reflected from the trees, it would, he considered, be altogether useless.

Mr. Pringle was quite satisfied with the surface produced by the putty, but he had some doubts whether that material could be always obtained. He had had some experience in broken focussing-glasses, and found that a rub with a tallow candle made a very fair substitute, and a candle could generally be procured more readily than putty.

Dr. J. Nicol agreed with the President in thinking that the landscape photographer was not likely to derive much benefit from the use of an actinometer. Referring to Mr. Turnbull's suggestion of a standard paper and standard tints, he thought such an arrangement would be of much value. It would, doubtless, very much facilitate photographic communication if one could say that by any particular process a picture could be obtained with a stop of $\frac{f}{30}$ in two minutes with light of seventy-five degrees. The only thing required would be a standard negative, and then everybody could tell everybody else all about everything connected therewith. He (Dr. Nicol), however, feared that much difficulty would be found in making a paper that would be always equally sensitive, even if its manufacture were confined to one maker, and much more would it be so if it were to be produced by several makers. During some recent experiments with various sizes for paper he had found that the age of the size very much influenced the printing qualities, especially in regard to the time required to produce an image. The same observation also applied to albumen, which, when used quite fresh, made a much slower printing paper than when it was allowed to get stale before use. So far as landscape photography was concerned he did not think there was much necessity for any actinometer, as he thought every photographer of even moderate experience had, whenever he put his head under the focussing-cloth, an intuitive feeling which told him pretty clearly exactly what number of seconds or minutes would be required. This, in his own case at least, and he had no doubt others had experienced it also, rarely failed to be correct.

Mr. W. Neilson said he always listened to Mr. Turnbull with pleasure, as his communications were not only the result of experience but always thoroughly practical. He quite agreed with Mr. Turnbull when he said that there was yet much to learn regarding actinism, and thought that those who were fond of experimenting and had time to gratify their desires should turn their attention to that department of photography. As a small contribution to the general stock he might say that he had generally found that longer exposures were required during the prevalence of an east wind. He thought an examination of much of the current landscape work of the day would show that the instinct mentioned by Dr. Nicol was not so general as he supposed, as they were too frequently very wretched. He would strongly recommend all who really wanted good pictures to expose two or three plates on each subject, giving, of course, different lengths of time to each. By this means they would be likely to get one good picture out of the three, and one good negative was surely better than a thousand bad ones.

Dr. Nicol stated that he was quite certain that the wretched pictures allluded to by Mr. Neilson owed their quality more to faulty development than to improper exposure.

Mr. Matheson said he had had the actinometer that was on the table for three years, and that the paper was apparently as good as ever. He had not put it to any practical use, as he could generally hit on the proper exposure quite easily. A few days ago, while photographing the Scott Monument, he had used it, and found the indication to be correct. In this case both camera and object were equally illuminated; but on going to the Grass-market, where the conditions were reversed, it was of no use. This, of course, corroborated what the President had said.

Mr. Dobie agreed with Mr. Turnbull that it was awkward for a photographer to be without silver—in fact, it was awkward for anybody to be without silver; but he really thought that they should take an example from ships of war, yachts, &c., and always carry duplicates of essential articles and *matériel* when they went to the field.

The following questions from the "box" were then read, but in the somewhat lengthy discussion that followed nothing transpired that was new:—How can paper be sensitised so as to keep for a lengthened period? and Why are some samples of paper so difficult to tone?

The President said that he had no difficulty with paper prepared in the way he had already published. He could guarantee that it would keep perfectly for at least six months, and if fumed it toned quite as readily and satisfactory as paper freshly prepared.

Mr. Turnbull found his method—that of floating on a five-grain solution of citric acid after sensitising—also very satisfactory for at least a month, and he had no difficulty whatever in toning. The prints, however, required to be very well washed before being put into the gold; in fact, he considered it a general rule that the longer a paper was kept the more washing would be required before toning. It was also stated on good authority that paper prepared with stale albumen was much easier toned than that prepared with fresh, and also that tinted paper required more time in the gold solution than white paper.

Dr. Nicol said that, as the members were always anxious to see anything either new or good in the shape of apparatus, he begged leave to exhibit two articles, which he had no doubt would meet with their approval. The first was an Aird's camera, which had been made for him by Messrs. Kemp and Co., and which, on examination, would be found to be a piece of very beautiful work. The camera was for plates $7\frac{1}{4} \times 4\frac{1}{2}$, and contained one dozen; it measured $9 \times 9 \times 11$ inches, and weighed, when fully equipped, nine and a-half pounds. It worked, as they could see, with perfect certainty, and, to him at least, the comfort derived from having everything connected with the exposure of a dozen plates in one package, and that neither heavy or very bulky, was very great. He might say that since Mr. Aird introduced the camera to the Society he had spent several days with it in the field, and found its comfort and convenience greater even than he had anticipated. [The camera was examined with much interest, and was very highly spoken of by several of the members who had seen it at work.] The other piece of apparatus he (Dr. Nicol) said was Hare's patent automatic changing-box and slide, kindly sent by the maker for exhibition. The box is in construction something like the once well-known changing-box manufactured by Ottewill, but without any of the disadvantages which that had, and especially without the large projecting cover. The mechanical arrangements by which the mere act of slipping off and on the slide into a groove on the top of the box shuts and opens the slit through which the plate passes is very ingenious, and the whole movement is so simple that it can hardly get out of order. To those who do not object to more than one package nothing, he (Dr. Nicol) said, could be simpler, or, so far as could be seen from the working of the box, more efficient. It was somewhat curious that they should have for exhibition on the same night two pieces of apparatus intended for the same purpose, but seeking to serve it by such different means, and it was quite as satisfactory as curious that they both did the work so admirably. The only difficulty which he could see was that of deciding as to which to choose.

The members generally heartily endorsed Dr. Nicol's statements, and spoke very highly of both camera and automatic changing-box.

On the motion of Mr. Dobie, votes of thanks were given to Dr. Nicol and Mr. Turnbull, and to the President for his unremitting attendance during the session, as well as for the urbanity and ability with which the duties of the office have been discharged.

The next outdoor meeting will be held at St. Monance, on the 10th inst., members leaving the Waverley Station at 6-30 a.m.

## LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The usual monthly meeting of this Association was held on Wednesday, the 2nd inst., at the Free Library,—the Rev. H. J. Palmer, Vice-President, in the chair.

The minutes of the previous meeting were read and passed.

Mr. W. M. Longton was elected a member, and Mr. Isaac Knott an honorary member, of the Association.

Two prints of *Brimham Rocks*, taken on gelatine pellicle plates by Mr. Willis, of Scarborough, were presented by him for the Society's album.

Mr. Palmer handed round a number of 9 × 7 and quarter-plate negatives of interiors, all taken on gelatine pellicle plates, and also some prints from the same. He (Mr. Palmer) explained that some were taken with Kennett's rapid pellicle with about six minutes' exposure, and some with the new slow gelatine pellicle with an exposure of about thirty minutes. With the latter pellicle he found that there was great latitude in the exposure, and he handed round three negatives of a group of flowers taken with an exposure of ten, thirty, and forty seconds, all of which were made equally good during development. For interiors he gave from five to thirty minutes' exposure. An interior of a church which he had many times failed to get with wet collodion under an hour and a-half's exposure he had got in half-an-hour with the gelatine pellicle, showing how superior these plates were for this class of work. It was necessary for interiors to back the plates with red or orange colour to prevent blurring.

Mr. W. Horseman Kirkby handed round some prints illustrating a handy method of recording the forms produced by iron filings under magnetic influence. [See page 282.] He (Mr. Kirkby) also showed a number of excellent prints from negatives taken by the collodio-emulsion process.

The Secretary, in the absence of Mr. J. A. Forrest, exhibited and explained the working of a new automatic changing-box, invented and manufactured by Mr. George Hare, of London, and kindly lent for exhibition by Mr. J. T. Taylor. It was so manifestly an improvement on the old form that many of the members had formerly used but had abandoned for double backs, that it was examined with the greatest amount of interest. The revolving sliding top, brass attachment, and spring shutter of the changing-box were great improvements on the old plan; for they perfectly excluded all light, the shutter only opening when the dark slide was fully attached. The dark slide also possessed a great improvement. Before the box is turned up to let the plate run out a bolt is pulled at the back of the dark slide; this opens the aperture of the slide and causes the back to spring slightly away from the front, thus leaving plenty of room for the plate to slide into its place, and doing away with the old risk of the plate sticking half-way. The back is then pressed forward until the spring-catch fastens; this secures the plate in its place and closes the end.

From the remarks and inquiries made it was evident that the changing-box met with the approval of the members and also of the owner, who had stated that "he used it with ever-increasing pleasure and satisfaction."

It was announced that Mr. Ellerbeck had presented the Association with a book in which members could state their wants and wishes in respect to exchanging apparatus, &c.

Mr. O. R. Green handed round and described a large and interesting collection of photographs which he had collected during a tour in Egypt, &c.

An excursion to Much Wenlock was arranged for Saturday, the 12th inst.; and the meeting was shortly afterwards adjourned.

## Correspondence.

### MALATE OF SILVER IN WASHED EMULSIONS.

*To the* Editors.

Gentlemen,—A short time ago, after having re-read Colonel Wortley's article on the use of malate of silver in emulsion work (vol. xx., p. 217), I tried it in the following way on some of the washed emulsion :—

To one ounce of a ten-grain solution of silver nitrate one minim of nitric acid was added; malate of ammonia was then dropped into it until a precipitate ceased to form. After washing the precipitate in more than a dozen changes of distilled water it was well drained, and then covered with three or four times its bulk of a three-grain solution of bromide of ammonium. After standing about half-an-hour the bromide solution was poured off, and the precipitate was again thoroughly washed with distilled water, and finally washed with several changes of alcohol to get rid of the water.

The whole of the precipitate was then added to *four ounces* of washed emulsion, which did not give sufficient density. (Mr. Bolton's first formula, without any addition whatever.) In a few minutes it turned to a grey colour, and in a few hours had reached a *dark* drab. A plate was tried. On development it fogged all over, but showed a distinct image through the fog.

As the emulsion was evidently useless, as a further experiment I added to it four grains of bromide of ammonium dissolved in alcohol. I could see no immediate effect; but in a few days it lost its dark colour considerably, and lightened to almost a steel-grey. A plate was tried, with a very gratifying result. It worked rather slowly (forty to fifty seconds with $\frac{f}{15}$ stop), but clean and dense. In colour it was golden brown, the negative possessing much greater printing density than one would judge from merely looking through it.

I would feel obliged if some reader who has used malate of silver will kindly give an explanation of the cause, &c., in the above experiment.—I am, yours, &c., L. T. Young.

700, *Passyunk Avenue, Philadelphia, Pa.,*
*May* 16, 1875.

[The experience recorded in Mr. Young's letter is very curious. Can any of our readers who are "up" in emulsion work offer an explanation?—Eds.]

### DRY PLATES *VERSUS* CUSTOM-HOUSE OFFICERS.

*To the* Editors.

Gentlemen,—I am about to start on a tour through Bohemia and Austria, in which countries there are many objects of great interest to a photographer. I should like to take my photographic apparatus, but as I work entirely with dry plates I am anxious to ascertain whether the Prussian and Austrian *douainers* are likely to open my packet of dry plates.

Many years ago I made a similar tour, having my camera, &c., with me. I found these officers *stupidly troublesome*, but beyond giving a deal of needless trouble they could do no harm. The case would be very different with dry plates.

I shall feel very grateful to you and any of the readers of The British Journal of Photography if they will kindly give me any hints they think might be useful.—I am, yours, &c., Horatio Ross.

*May* 31, 1875.

### THE CHLORIODO-BROMIDE PROCESS.

*To the* Editors.

Gentlemen,—If the advantages and specialities which Mr. M. Carey Lea asserts in his last letter for the addition of a small quantity of iodide to the chloro-bromide plates be all, I really do not think that many people who have made so simply and easily the former (I will not call them Wortley plates) will go much out of their way to make them.

The two first have respect to the colour and "change of *actinic transparency*" as preventive of blurring. Now I am sure you will remember the bromide plates I sent you *backed with silver*, which you honoured with special commendation both as to density and freedom from the least blur. I then assured you that I had not backed a bromide plate for several years, and you owned the experiment to have been a crucial one. You did, indeed, venture to suggest that the plates might, perhaps, be dense. I replied they were not at all unusually dense. The silver plates were coated with the ordinary emulsion and laid in the ordinary preservative, and had the usual characteristics of all plates made with the bromide emulsion of Colonel Wortley's proportions. Why, then, need we desire anything more?

As to *extra* sensitiveness, I never go in for it in ordinary landscape plates. I find the proportion of eight grains of bromide of cadmium to fifteen or sixteen of nitrate of silver, with one drop of hydrochloric acid (the chloride principle), quite rapid enough; for I think an exposure of from ten to thirty seconds short enough for anything, and if you exceed that rapidity there is generally a proportional difficulty in intensifying, but none exists with that proportion. But if you really want it you have only to increase the number of grains of silver nitrate to twenty, and I believe the plates, with a proper preservative, become as sensitive as any *reliable* plates can be. I do except here those made with Mr. Kennett's pellicle, which I believe to possess all the sensitiveness he claims. My difficulty with the pellicle is that the plates require some experience and apparatus to make them nice and even, and that they demand considerable time and trouble to intensify them.

Almost every one who tries the addition of iodide to bromide emulsions complains of the difficulty and uncertainty in making a smooth and unclotted mixture with it; and if the advantages, even with the very large excess of silver, appear so small or doubtful when it is made, where is the really practical use or excellency of it?

There are one or two points, also, to which both Mr. Lea and yourselves have referred, on which I have several times written without contradiction, but which seem again and again to be ignored. I do claim to have been the first to use porter and beer as a preservative, to the great amusement of the Manchester Photographic Society at the time. I used it, even before I knew of emulsion plates, for ordinary bromo-iodised wet plates washed and coated with one or other, and I gave, in a very old number of your Journal, my *rationale* of their good qualities.

I also claim to have been the first to recommend putting certain kinds of emulsion plates into the preservative without washing, and I mentioned the preservative—a very strong one of two grains of pyrogallic acid to one ounce of beer. Forgive my again asserting these claims. I should never have thought of doing this through any wonderful merit in them, but when I find them claimed by others as such I really must say that your pages are sometimes badly treated.

One of your correspondents asks me, Mr. Lea, or Colonel Wortley to say what is *a discovery* and what is *a complication.* I venture to reply that I consider a discovery to be the invention, of proved use, of any

*new* and valuable material in a process which adds an important excellence without too great trouble or drawback; and I consider that a *complication* recommends a vast deal of trouble and bother without adding any corresponding advantage.—I am, yours, &c.,

*Hilgay Rectory, June* 7, 1875. ST. VINCENT BEECHY.

[Our esteemed correspondent has not read with his usual care the question put to him by the correspondent to whom he refers in the concluding paragraph of his letter. We repeat the question as it was printed in our columns on May 14th:—"What constitutes a discovery or *invention?*" It will be observed that the real question differs somewhat from what Canon Beechy imagines it to have been.—EDS.]

## EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at the small cost of one shilling in our advertising pages. This column is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

A No. 2B Dallmeyer portrait lens offered in exchange for studio furniture.—Address, T. C., 106, St. Mary-street, Weymouth.

Wanted to exchange a good posing chair covered with dark velvet for a half-plate lens and camera.—Address, G. HOWARTH, Smithy-lane Side, Littleborough, Lancashire.

Wanted, a posing chair, tourist's stereo. camera, pair of lenses, and lens to cover 7 × 5 plate (landscape) by good maker, in exchange for photographic apparatus or first-class jewellery.—Address, A. B., Post-office, Carmarthen.

A gold hunting watch (cost, two years since, £14) will be given in exchange for a whole-plate lens by a good maker, three and a-half inches diameter, and not less than ten inches back focus.—Address, J. BOWEN, 2, Priory-place, Kilburn.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

*** Owing to a more than usually severe pressure on our columns this week we are reluctantly compelled at the last moment to leave over several articles, reviews, and letters which we had intended for publication in this number. We trust to be able to find space for all in our next.

WILLIAM WESTON.—Received. In our next.

THOS. GOORST.—Received. Thanks. In our next.

E. S.—Thanks; but the edition we wish for is the *seventh* one.

H. R. H.—We perfectly understood the motives that prompted your action, and quite appreciate them.

R. W.—Take an ordinary paraffine candle, and, having melted it in a porcelain vessel, apply it by means of a brush. Pitch ought not to have been used.

"GLASGOW."—A sample of sensitive paper has been received in an envelope bearing this postmark, without being accompanied by any explanatory letter.

PHOTOLITHO.—If you call at our office you can see specimens both of the platinum printing process of Mr. Willis and the mechanical process of M. Despaquis.

A MERRIE-CUS (Philadelphia).—The communication and remittance received, Thanks. The Publisher will endeavour to procure the desired views, and if successful, will forward them.

S. L.—A mixture of equal parts of golden syrup and water may be applied to the plate after development. Proceed with the intensification and fixing as soon as possible after your arrival home.

JOHANNES MÖLLER.—From the report of the meeting of the London Photographic Society which appears in this number it will be seen that the exhibition opens in October. Further particulars will be duly announced.

D. D. D.—It was as a fixing agent, and not as one to be used in connection with toning, that Mr. Hooper recommended sulphocyanide of ammonium You will learn our opinion of this salt by perusing a leading article in the present number.

PHILO.—As the fog always occurs on one particular part of the plate we infer that there is some slight crack or chink in the slide through which light permeates. Nothing remains bnt exercising your powers in making a minute examination.

G. W. G.—The reticulation of the collodion is due to the presence of water in the solvents. The alcohol employed in the experiment indicated by "A" is far too weak. You must strengthen it by one or other of the methods we have so often published.

JOHN GUNSTON.—1. We cannot account for the milkiness of the solution of albumen. Try the method of treatment with acetic acid recommended by Mr. Ackland.—2. It will be both cheaper and better to make a new toning-bath.—3. Yes; it was described very recently.

OPERATOR.—An "HB." pencil will answer quite well for retouching in connection with the varnish of which we published the formula. We may reply to the query in the postscript of your letter by saying that we do not think any better retouching varnish can be made than the one referred to; we certainly have never seen any to surpass it.

J. H. WAITE.—You will derive much assistance from Lake Price's *Manual of Photography*, for he treats the subject of landscape composition with great fulness. The third query in your list is the only one to which we can give a definite reply in this column. A subdued light is much better than strong sunlight, and the morning is better than the afternoon.

R. R. T.—The rapidity of the lens will be greatly increased by removing the central fixed diaphragm. But, although working quicker, it will not then cover such a large plate with sharp definition. We cannot tell what the motive of the maker was in allowing such a diaphragm to be fixed in the lens tube; but in doing so he certainly prevented the objective from being as useful as it otherwise would have been.

J. R. (Crewe).—It may be well to slightly increase the proportion of iodide in the albumen. With such a method of development as you have adopted there ought to be no difficulty whatever in obtaining even more intensity than is desirable. With so much exposure as you have been giving it will be almost impossible to make dense negatives; for fogging will be certain to step in long before intensity is obtained. With an $\frac{f}{64}$ stop an exposure of ten minutes in sunlight is too long.

PHILO.—There is no great advantage in the substitution of carbonate of ammonia for the commercial "liquor ammonia" in connection with pyrogallic acid. If anything be gained at all it lies in the possibility of using a much greater quantity of the carbonate than is admissible if the liquid be employed. This arises from the fact that the liquor ammoniæ is a solvent of silver bromide, which the carbonate is not—that is, beyond the effect of the free ammonia contained in any particular sample.

A. G. MASSEY.—Received, and will be attended to. What was meant in the "Answer" to which reference is made is this—Registration *alone* does not confer copyright; there must also exist the right of the individual to register it. For example: if *you* take a picture and register it you have a good copyright in that picture; but if anyone were surreptitiously to obtain a copy of a picture taken by you, although he could register it by entering it at Stationer's Hall he could not thereby secure a copyright in it, because you had not formally transferred to him your rights in that picture.

M. P. YOUNG.—A good lantern condenser of large diameter will answer well for concentrating the light upon a print while it is being exposed in the printing-frame. We cannot precisely say to what extent the operation of printing may be accelerated by this kind of treatment, but we have a vignette carbon print that was exposed for sixty seconds only, and it is fully done. In a good light we would undertake to produce a carbon print with an exposure of three-quarters of a minute; but this, let it be understood, can only be effected by concentrating the light upon the print.

RECEIVED.—Rev. J. D. Riley; A. G. Massey; Wm. Rowe; T. S. Hicks; P. O'C.; J. P. Marston; and Geo. B. These in our next.

ROYAL CORNWALL POLYTECHNIC SOCIETY.—The list of prizes offered by this Society for photographs exhibited at the forthcoming Exhibition—which is to be opened on Tuesday, the 14th September next—is as follows:—*Sec. I. For Professional Photographers*:—1. For the best composition landscape—a silver medal.—2. For the second best ditto—a bronze medal.—3. For the best untouched landscape, sky only printed from separate negative—a silver medal.—4. For the second best ditto—a bronze medal.—5. For the best untouched landscape, from one negative only—a silver medal.—6. For the second best ditto—a bronze medal.—7. For the best portrait or group—a silver medal.—8. For the second best ditto—a bronze medal.—9. For the best untouched enlargement—a bronze medal. The judges may decline to make an award in any of the above classes when less than three pictures are in competition in that class. Exhibits in this section are available as prizes in the Art Union of Cornwall.—*Sec. II. For Amateurs only*:—Medals and prizes are offered by the Society for meritorious productions in this department. NOTE.—*Carte-de-visite* portraits are excluded from both sections of the photographic department.

## METEOROLOGICAL REPORT,

*For the Week ending June* 9, 1875.

Observations taken at 406, Strand, by J. H. STEWARD, Optician.

THESE OBSERVATIONS ARE TAKEN AT 8.30 A.M.

| June. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 3 | 29·95 | E | 58 | 65 | 84 | 56 | |
| 4 | 29·90 | W | 57 | 60 | 84 | 57 | |
| 5 | 30·02 | W | 55 | 62 | 73 | 56 | |
| 7 | 30·15 | W | 55 | 61 | 71 | 56 | |
| 8 | 30·17 | W | 57 | 62 | 79 | 57 | |
| 9 | 29·88 | SE | 57 | 64 | 80 | — | |

CONTENTS.

THE BRITISH
# JOURNAL OF PHOTOGRAPHY.

No. 789. Vol. XXII.—JUNE 18, 1875.

## THE LAMBERTYPE AND CHROMOTYPE PROCESSES.

A few days ago we witnessed a series of demonstrations in connection with a method of producing enlargements not altogether unknown to our readers by reputation, specimens produced by its agency having been present at the last photographic exhibition; and we have already published the specification of the patent by which M. Lambert has sought to protect his invention. In what follows we shall endeavour to give an account of this process from the dual point of view of the printed specification on the one hand and of the practical demonstration on the other.

We may premise that M. Lambert, as will be seen from our advertising pages, is at present in this country introducing his process to the notice of professional photographers. The first and, indeed, the leading feature in the "Lambertype," as the process has been designated by M. Lambert, is the encasing of the large negative between two sheets of very thin and translucent paper. The enlarged negative itself may be obtained in the usual way, that which was utilised while we were present being from a *carte de visite* in our possession the negative of which had been broken. From this *carte* a negative was made by wet collodion, and from the negative was printed a carbon transparency, resulting finally in an enlarged carbon negative. At this stage the special method of finishing is introduced.

By means of gum applied round the margin of the negative a sheet of very fine, homogeneous, and translucent paper (known in France as "*papier minéral*") is attached to each side—to the front as well as to the back of the negative. So far as we can ascertain, paper of this kind has not yet been commercially introduced into this country, although there is no doubt of its being so very shortly. We have made a good substitute for it by coating thin wove bank post with castor oil dissolved in alcohol with paraffine, and also with other bodies possessing properties of a similar character. The optical effect produced by the two sheets of paper is that the texture of one is neutralised by that of the other, the texture of the enlarged negative being influenced by both, and a charming softness produced.

On a negative encased in this manner we saw M. Lambert operate. First of all, by means of a crayon stump—manipulated with a degree of deftness which showed that gentleman to be a master in this branch—he strengthened those parts requiring such aid by powdered plumbago. This strengthening was effected on the *back* of the negative, a large retouching-frame of the usual construction being used. In an incredibly brief space of time the parts previously wanting in vigour and harmony were strengthened, an agreeable softness pervading the whole negative. Sharp, decisive, and delicate touches were now made on the paper covering the *face* of the negative, a blacklead pencil or a stump being used according to the nature of the part requiring such aid. When the value of these retouching operations was tested by the most satisfactory of all tests, viz., placing the negative in the printing-frame with a sheet of sensitive paper, the result was a print so fine, delicate, and harmonious as to elicit very decided expressions of marked approval from the various gentlemen present.

For masking, removing any objectionable portions, or even for introducing what was not in the original, this process affords great facilities. We have seen specimens in which parts of the hair and body were added and from which other parts had been removed with such a degree of success as not to be possible of detection.

The masks employed are made of yellow paper, and are cut out with great rapidity to the proper form by very simple means. A hair pencil charged with oil colour is run round the outline of the figure, this outline being drawn on the glass plate of the printing-frame. A sheet of yellow paper, having been pressed in contact with this glass, is made to receive an impression of this outline, and a mask is then cut out and fastened in front of the glass. In this way, and by the adoption of other simple yet very effective "dodges," which require to be seen in order to be rightly understood, were produced the results to which we have above referred.

The "chromotype" process is one of a different nature, being a modified method of carbon printing. It was not in operation during the time of our visit, hence we shall reserve a description of it for two or three weeks. One leading feature in connection with it, however, is the development of the prints upon an opal glass which has previously received a coating of plain collodion. This, it is said, allows of the production of much finer gradation and delicate details than can be obtained by developing the image on a zinc plate. To the details of this process we shall afterwards direct attention.

## LANDSCAPE PHOTOGRAPHY WITHOUT GLASS.

Many have been the attempts to do away with the use of glass as the support for landscape negatives, and also, indeed, for portraits, but hitherto no satisfactory substitute has been discovered. We should, perhaps, be more correct in saying that no satisfactory substitute exists as a commercial article, and amateurs are loath to enter into the necessary manufacture when glass can be obtained ready to hand.

The advantages gained by the use of a pellicular support in place of the bulky glass plates now in use are undoubtedly so great that we need not here descant upon them; but, at the same time, it must be owned that the rejection of glass would entail a slight amount of extra trouble in the preparation of the sensitive films. This, we think, however, would not weigh against the advantages to any great extent.

Cases arise in which it is next to impossible to carry out the cherished idea of months solely in consequence of the inconveniences arising from this one matter. For instance: last summer a friend of ours started upon a tour of some weeks for photographic purposes, his destination being Norway. In view of the richness of the country pictorially, and the length of time it was his intention to spend there, he took with him several dozen dry plates of large size. But, alas! after having exhausted the comparatively tame scenery in the neighbourhood of Christiania and Bergen, he was compelled reluctantly to relinquish the glorious scenery for which the interior of Norway is celebrated. The roads amongst the mountains are inaccessible to all conveyances except the native *carriole*, which our friend described as a "cross between a box on wheels and an American racing buggy," and which affords very slight accommodation for unnecessary baggage. Had it been possible to obtain the

requisite assistance the laborious journey on foot over hundreds of miles of mountain road would have been too costly an affair; so the intended tour fell through for want of a material capable of carrying a collodion film without the bulk and fragile nature of glass.

Since the introduction of collodion and consequent employment of glass the taste has become so far educated as to reject any results which are accompanied by circumstances of texture and transparency in any way inferior to glass itself, and in spite of the numerous attempts to render paper translucent or transparent we cannot accept that substance as a possible substitute—at least, for the final support. Thin sheet gelatine, which has the advantage of being free from structure and perfectly transparent, is, unfortunately, not an article of commerce, and few amateurs have the facilities for making it in sufficient quantity for themselves.

We have recently been engaged in a series of experiments in a similar direction to the course laid down in an article at page 288 of last volume, and have obtained such promising, if not really satisfactory, results as to warrant our hoping for ultimate success. The way has been partially cleared for us by the recent introduction of emulsion processes in which no washing of the plate is necessary; and we think it quite within the bounds of possibility that an amateur may be enabled to start upon a walking tour carrying with him the materials necessary for the production of several dozen negatives.

But to turn to the practical part of our experiments. We start by rejecting all idea of using paper as the *final* support, but we avail ourselves of it as a temporary means of carrying the sensitive film, which may subsequently be made into a pellicular negative by means of gelatine, collodion, or solution of gutta-percha, or, if preferred, may be transferred to glass.

The first point requiring attention is the paper; and this, unfortunately, must undergo special preparation at the hands of the amateur himself in order to prevent the collodion from sinking into its pores. The paper we have used is ordinary albumenised paper, which may or may not have the albumen removed, as the salt contained in the latter is rendered quite innocuous by the subsequent sizing. For this purpose we cannot do better than refer our readers to the directions given in the article previously referred to. The sizing consists of—first, saturating the paper with a solution of india-rubber in benzole. This performs a double office—it renders the paper waterproof, preventing the solution from staining it, and also enables the picture to be separated from the support after development. After drying the coating of india-rubber (which may be applied a second time) the paper must be floated upon a warm solution of gelatine and laid out flat until the gelatine has set, after which it may be hung up to dry, precautions being taken to secure its drying as flat as possible.

When dry it may be cut into suitable sizes, and will be improved by hot pressing. This may be performed on a small scale by laying it gelatine side downwards upon a sheet of plate glass or of polished metal and passing a hot iron over it, a sheet of clean paper being placed between the iron and the prepared paper. Of course care must be exercised, if plate glass be used, not to have the iron too hot nor to allow it to remain long in the same place, or the glass may be broken by the heat. The prepared sheets are then to be kept flat between the leaves of a book or in a portfolio.

When required for use a sheet of the prepared paper should be pinned by the corners upon a piece of thin board the same size, and coated with emulsion in the same manner as a plate of glass. The emulsion we use for this purpose is one which requires no washing; so, consequently, when coated, the paper may be hung up at once to dry, after which it may be stored away under slight pressure until required for exposure.

The exposure may be effected in the ordinary way, the paper being pressed flat against a plate of good clear glass contained in the slide, or, better, may be fastened by the edges to a plate of the requisite size and exposed without the glass in front. The cement we have used for this purpose is composed of gelatine and treacle, in the proportion of two parts of the former to one of the latter, and made of a consistency half a syrup and half jelly when cold.

The edges of the plate are tipped lightly with this mixture to the depth of an eighth of an inch, and the back of the sensitive paper pressed into contact by laying a sheet of clean white paper upon the collodion side and passing a squeegee lightly over it. The advantage of the mixture of gelatine and treacle is that it does not dry—at any rate for some hours; and, consequently, after exposure, by raising one corner with the finger nail the exposed sheet may be stripped off and an unexposed one substituted. The cement keeps the paper in place quite perfectly, and if of the proper consistency does not require renewing with each sheet. If the paper be left in the slide so long that the cement becomes hard it can be detached by cutting round the edge with the point of a penknife.

The practical application of this method which we have in view is this:—An amateur may undertake a walking tour in Scotland, Wales, or, indeed, anywhere beyond the reach of civilisation and conveyances, taking with him, in addition to his apparatus, a dozen plates, a bottle of emulsion, a few dozen sheets of prepared paper and a small bottle of cement. Thus equipped he is able to carry everything he requires, and each evening before retiring to rest can detach his exposed sheets, replace them by fresh paper, which may be coated *in situ* and the new plates put into the slides for next day's use. Half-an-hour of such work each evening would carry him on for weeks even if his exposures reached a dozen per *diem.*

This happy picture is not yet quite realised, but we hope the day is not far distant when it will be. The obstacles in the way at present are merely matters of detail which we hope to overcome shortly. Of the development and completion of the negatives, and also of the application of gelatine emulsion, we shall treat shortly; meanwhile we would invite those of our readers who may be interested in this subject to enter upon the line of experiment we have indicated.

Since the foregoing article was written this subject has been brought before the South London Photographic Society by Mr. Warnerke, who has described numerous experiments conducted by him with a view to the successful practising of photography without glass. These experiments have been crowned with success. As they are to be fully described shortly in this Journal we shall not here anticipate Mr. Warnerke's account of his important experiments.

## ON THE USE OF GROUND GLASS IN THE STUDIO.

There is, perhaps, no question in which the professional photographer is more interested than that of how best to construct and light the studio, and very few on which more has been written or in connection with which more conflicting opinions have been expressed. So far as regards the size and form of the building, the artist is not in all cases free to carry out his ideas of what would be most suitable for his work, but is constrained to adapt the studio to the situation, and make the best of the convenience at his disposal. In the matter of glass, however, he is generally at liberty to give free play to his fancy; and, judging from the many glass houses we have seen, the fancies of photographers are varied indeed. They have studios with ordinary greenish crown, studios with colourless sheet, studios with various shades of blue, and studios with ground glass; and some of them, as if undecided as to which was best, indulge in a combination of all three.

The relative merits of the various kinds of glass have frequently been discussed in our pages; but we are induced to recur to the subject again in consequence of some experiments which we recently had an opportunity of seeing tried in the studio of one of our most extensively-employed and most fastidious professional friends. The studio in question is built strictly according to the fancy of the proprietor, and is nearly square, measuring some thirty feet by twenty-five, and glazed to the floor on all four sides. Originally it was fitted with a most complete arrangement of curtains, and was found for all ordinary purposes to answer admirably, as the sitter might be placed in any desired position and lighted to any extent in any direction. As, however, he numbers amongst his *clientèle* a great many babies and children—of whom, although he advises his neighbours to fight shy of them, he seems very fond—he soon found

that sufficient curtain power to keep out sunlight rendered too long exposures necessary, and so set about devising a scheme that would overcome the difficulty.

Blue glass was first tried, but only to be abandoned in a very short time—the loss of light, notwithstanding what has been so often said to the contrary, having been found to be considerable, while the unpleasant effect of direct sunlight still remained. The pictures were undoubtedly softer, but they were wanting in that vigour and brilliancy which is a usual characteristic of our friend's work; and the unnatural, we might almost say offensive, blue appearance given by it to everything and everybody in the room was such that neither sitter or operator could get reconciled.

The blue glass soon gave place to ground glass, in the hope that it would put an end to his troubles; but, when weighed in the balance of actual experiment, it was found miserably wanting. The quiet, subdued light which it transmitted was undoubtedly very pleasant when the sun did not shine, but then that was just the time when it was not wanted; and when the sun did shine the evil was intensified a thousand fold, as every little facet of the ground surface projected in a straight line into the studio a miniature sun of such dazzling brightness that our friend declared it would have blinded him in a week. Nor was this all: the loss of light was such that an exposure of nearly twenty-five per cent. longer was required than with the ordinary glass. This, or at least a loss of light to this extent, we were not prepared for; but on tentative trial, by placing a piece of sensitised paper in the printing-frame, one half covered by a piece of polished plate and the other by a plate with one surface ground, we found that our friend's estimate was not far wrong. Of course the ground glass was at once removed and replaced by ordinary crown as at first, and the whole studio fitted with perpendicular louvre boards, each just the breadth of a pane. These were made of a very light frame of wood and covered with green cloth, which does not in the least fatigue the eye, and produces a very pleasant effect in the house; and, as they are not hinged, but simply fixed to the astricals by hooks, any number of them can be removed in a few minutes whenever a large, open expanse of glass is required. By this arrangement our friend thinks he has now got his studio into a completely satisfactory state, and, as we saw him making first-rate negatives of some troublesome "little ones" with an exposure almost instantaneous, we think he is not likely to make further alterations.

Although the result of these experiments is condemnatory of the general use of ground glass in the studio, there are circumstances in which it is of much value, and where it is to be strongly recommended. In cases, for example, where one side of the glass house is within a few feet of a dead wall, and where the only light that can find entrance is that which the wall reflects, the ground glass will be found of very great use. Of course if the wall could be whitewashed matters would be much improved, but neighbours are not always willing to oblige the photographer by allowing him to do so. An experiment, recorded we think by the late Sir David Brewster, shows that a large increase of light can, under the circumstances, be easily got in a very simple way. He was anxious to decipher the inscriptions on certain brasses in a vault lighted by a single small window, and as it had opposite, and within a few feet of it, a high, dark-coloured wall, the light admitted was hardly more than sufficient to make darkness visible. The veteran scientist, however, knew well how to turn his scientific knowledge to practical account, and so got a friend to hang on the outside of the window, and flush with the wall, a white "blind" in the shape of a pocket handkerchief—not for the usual purpose of keeping light out, but to send it in—and so was able to read the inscription easily. The explanation is, of course, quite simple. The only light that could reach the window came direct from the sky, and, as it fell on the glass at an acute angle, it was nearly all reflected at the same incidence; but when the window was covered by the white cloth there was no highly-reflecting surface to throw it off, and so a considerable quantity of it was transmitted. If the side of a studio so situated be glazed with ground glass, having the ground surface on the outside, the increase of light from this cause will be such as to astonish those who have not turned their attention to the subject.

To those, however, who have studios in the position already mentioned we are glad to say there is no necessity for going to the trouble and expense of removing the glass that may be already in, as there are several varnishes or preparations which, if put on the outsides of the panes, will answer the purpose nearly as well. One of the best is, perhaps, that recommended by Dr. Ferguson in a paper read some years ago before the Royal Scottish Society of Arts, and for which, we think, he received the Society's silver medal. It consists of a mixture of carbonate of barytes and solution of silicate of potash, made to about the consistence of cream. This is daubed or stippled over the glass with a painter's large brush, and, as it hardens in a few hours and is almost insoluble in water, it answers admirably, and may be freely cleansed with water when necessary.

We remember seeing, shortly after Dr. Ferguson's paper was read, an excellent example of the value of the application. The laboratory of experimental physics of one of our educational establishments is on the ground floor, and there was at that time a lecture-room built within a few feet of the window. This made the laboratory so dark that gas had to be burned whenever it was used. The carbonate and silicate were applied, and the result is that the room is almost as well lighted as it was before the lecture-hall was built. Of course it must be remembered that the varnish should be applied to the *outside* of the glass; if put on the inside it will only make matters worse.

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In another column will be found a communication received from a correspondent signing himself "G.," in which further testimony is borne to the value of Mr. M. Carey Lea's new emulsion process. The pictures accompanying the communication are very satisfactory, more especially those produced by the formula with excess of silver. Since publishing the result of our experiments, in the course of which we spoke of the difficulty experienced in emulsifying the iodide, we have satisfied ourselves that such difficulty is much decreased, if not altogether removed, by the use, as our correspondent suggests, of a bottle sufficiently large to contain at least three or four times the bulk of emulsion to be operated upon. The same suggestion has been made previously by Mr. Lea. With regard to the statement that the addition of tannin or gallic acid to the washed emulsion for the purpose of conferring density does away with its keeping qualities, it is on record in our columns that such an emulsion has been kept for a period exceeding twelve months, and was at the end of that time at least as good as when newly made.

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## THE CHLORIODO-BROMIDE EMULSION.

According to promise made some weeks ago I have put to practical test the proposed modification of the emulsion process by the introduction of an iodide. Having a bottle of collodion, composed of residues of various samples poured together about two years ago, I divided it into two portions, one of which I proceeded to treat according to Mr. M. Carey Lea's directions, following them implicitly, with the exception of using nine instead of eight grains of bromide of cadmium (being a good sample of crystallised); and the other I treated with nitrate of silver twenty grains, bromide of ammonium ten grains, and nitric acid two minims per ounce.

After keeping both samples twenty-four hours I coated of each sample two plates $8 \times 4$, which I plunged into Mr. Lea's bath (which three times filtering did not render transparent), and one which I washed and coated with plain tannin. I then washed the remainders, treating the former with Mr. Lea's preservative bath, and the latter again being divided into two, one of which was soaked in strong tannin solution and one simply washed. These were redissolved and plates coated with each sample. Beside these Mr. Mawdsley had prepared from a known and excellent cotton a washed emulsion after Mr. Lea's formula, of which he gave me a bottle, and against this I set a sample made by myself from the best kind of cotton I found in America, and one which I was informed Mr. Lea himself uses, viz., Parys'. It is one of the best trade samples I have yet found, though Mr. Mawdsley found it inferior in sensitiveness to that he generally uses, and from which his chloriodo-bromide emulsion was prepared.

These plates were tested in the following manner:—A plate of each of those prepared with Mr. Lea's bath (No. 1) were put side by

side in an 8 × 8 holder; one each of those prepared with tannin (No. 2), and one each with the washed emulsion (No. 3), chloriodo-bromide, being matched with bromide plates, and the sample prepared by Mr. Mawdsley (No. 4) with that from the American cotton.

They were all exposed on a sunny day with light haze, a fair, equable light, with a pair of Ross's symmetrical six-inch focus lenses, with partitions to give two exposures on each plate. To one half of each I gave thirty seconds, to the other ninety, besides which I exposed an 8 × 8 plate of each of the washed emulsions in four exposures for each.

These plates were developed, in precisely the same manner, with a strong pyrogallic solution and a minimum of bromide, added after the image was well out, and with the ammonia, the quantities in each case being the same to a nicety.

In every instance the pure bromide plate proved more sensitive than the iodised, the differences being greatest in those which had been prepared with the bath. The Nos. 1 and 2, iodised, gave images so thin as to be quite worthless, while the bromised gave fair density, No. 1 being also full of preservative marks and streaks. The portions of the iodised plates exposed ninety seconds gave scarcely more detail in the deep shadows than those of the bromised with thirty seconds, there being no perceptible difference in sensitiveness between Nos. 1 and 2. In No. 3 it was seen that the sample of collodion was not as good as might have been for washed emulsion, both samples lacking intensity, though not deficient in sensitiveness—the iodised being again less sensitive, but looking much the best *before fixing*. In No. 4 there was less difference; and in repetitions of this comparison I found the difference to be less in some trials than in others, but it was always in favour of the bromised plate. In the 8 × 8, although the timing not being simultaneous could not be compared with precision, the differences were the same.

The general differences in the behaviour of the two forms of emulsion were very marked. The iodo-bromised film showed a much more brilliant image by reflected light, the image coming out in a decided black, like a gold-toned wet plate, and at first sight I thought it possible that I had been mistaken; but when the fixing had been done the iodo-bromised image proved both weak and less fully exposed, the reduction of intensity being most decided, though very weak hypo. was used, while the pure bromide film was always more intense after fixation than it seemed before.

Besides this I found in the washed emulsion films with iodo-bromide a very marked tendency to spots of insensitiveness, as if the iodide of silver, left to itself and in the absence of the excess of soluble salt necessary to form the emulsion, had begun a process of segregation, and was not evenly distributed in the film. The image seen superficially (as a positive on a black ground) seems more delicate, and resembles somewhat a positive on glass backed with jet varnish; but it is more purely superficial, and examined under a strong lens by transmitted light this is seen to be illusory, and its printing efficiency is very small compared with the bromide film.

My results are, therefore, in all respects different from those of Mr. Lea. I find that the chloriodo-bromide film is less sensitive, less dense, loses more by fixation, and is more subject to markings and spots than the bromide, and the only real advantage I can conceive in it is that, in a sample of cotton which does not make a good washed emulsion film (as in plates No. 3), an iodide *may* give intensity where pure bromide will not, and so make a working emulsion out of one which did not work well;* but where the cotton is (as in No. 4) really good there is no comparison between the results, even considered apart from sensitiveness.

Mr. Lea finds the images lose intensity by fixation even with bromide. I find the contrary, and often spoil negatives by not making allowance for the greater apparent intensity after fixation.

On the whole, I suspect that Mr. Lea has been working with chemicals very much inferior to those we use here. The hypo. I get, used in a *saturated* solution, will not reduce my bromide films in the least, and I often use even cyanide of potassium strong enough to clear a negative in ten seconds without any injury. When a film shows any tendency to lift I use hypo. very weak; and, if it lift then, I use cyanide, and have never found any ill effects from it. Colonel Wortley tells me he has long used cyanide with his films habitually.

Again: Mr. Lea speaks of tannin as always giving opalescent solution. Mine is as clear as pale sherry and filters like water, and it is only the ordinary commercial article of Messrs. Hopkin and Williams, being sold, I believe, at a shilling or two the pound. Mr. Lea's albumen does not coagulate with his tannin; mine does, take what precaution for mixing I will. The fault may be in the tannin, or it may be in me; but as my albumen is taken from fresh eggs, and that does not vary with the climate, I do not see that it can be in fault. My impression is that Mr. Lea does not use that exactitude in his experiments to which we have long been accustomed on this side of the Atlantic.

It may be said, on his part, that I have not proved anything against his process by failing with it, and that my failure does not invalidate his success. I have, however, given the "process" as fair a trial as I was capable of giving it, and if, with the experience I have had with emulsions, I cannot make it work, I venture to say that the public, and even the mass of amateurs, will find it of little use. Operations which are necessarily subject to such numbers of minute precautions that in following a given formula a chemical of a slightly different degree of purity from that which was originally used, because furnished by another chemist, will reverse the effect of combination are of no value to the average amateur. The chemicals I used were from Messrs. Hopkin and Williams, and the haloids were not dried lest there should not be sufficient excess of silver, but in this I only followed Mr. Lea's example. In short, every condition was as nearly the same as was practicable.

With regard to the question of halation, there is one fact which I have long ago noticed, but which I have not seen mentioned, viz., that keeping an emulsion for two or three days after sensitising before using it will prevent halation even when no backing is used. To this end not less than fifteen grains of silver nitrate should be used, and after keeping three or even four days the excess of silver should be converted by a bromide (or chloride, as suggested in Mr. Newton's article). This has long been my practice, and your readers of two or three years ago will remember that I then published experiments which showed that an emulsion kept for six weeks with an excess of silver nitrate, and which fogged to the extreme, was recovered by excess of bromide, so as to be perfectly clear and to work without a trace of halation—a fact which you then attributed to the conversion of the excess of silver nitrate charging the film more highly with silver bromide, but which experiment will show to be even more due to physical alteration of the pyroxyline, though the amount of bromide has doubtless its effect. W. J. Stillman.

P.S.—Mr. Mawdsley's experience with the chloriodo-bromide emulsion entirely confirms my own. His estimate of its sensitiveness is as low as I have put it.—W. J. S.

* This opinion is confirmed by a note from Colonel Wortley on the subject.—W. J. S.

## URANIUM AND ITS USES.

[A communication to the South London Photographic Society.]

Uranium was unknown to the ancients. The Phœnicians, in some of their visits to Cornwall for tin, might have picked up the ore or source, but they did not know it nor what it contained. For a long time the mineral or compound mass was supposed to be a zinc ore, and was named "pechblende;" but in 1789 Klaproth discovered that pechblende contained uranium. The metal was named after the planet discovered by Herschel in the same year. There is very little uranium in the earth. Perhaps there is more in Uranus, but that country is far off and we are not likely to know. However, the little we have has been found useful in the arts.

There are various salts of uranium, but nitrate and persulphate are the most common. The latter is employed chiefly by glass makers, potters, and enamellers for making yellow stains.

The nitrate of uranium is of most use in photography, and is obtained by crushing the ore pechblende, heating it in a muffle, and digesting it in nitric acid diluted with four parts of water. The nitric solution is filtered and sulphuretted hydrogen passed through it to throw down other metals. The clear solution is poured off, boiled, filtered, evaporated, and crystals of nitrate of uranium are deposited. All photographers may not be so well acquainted with uranium as they are with silver. I submit samples, labelled. I have said enough about uranium; now for its uses.

Theory and practice are sometimes widely at variance; but my practice has invariably confirmed my theory respecting the use and value of nitrate of uranium when employed in photography. My earliest experiments with uranium convinced me that it was in no form so useful or so sensitive to light as the salts of silver, therefore I adhered to the theoretical conviction that it would be useless to add nitrate of uranium to the nitrate of silver bath to obtain increased sensitiveness; for, speaking figuratively, I thought it folly to expect the pace to be quickened by yoking a slow horse to a fast team. That the uranium salts are less sensitive to light than the silver salts is known to most photographers; but if any evidence on that point be needed I think that the two examples I now place before you will supply it. No. 1 is salted paper floated on a sixty-

grain solution of nitrate of silver for three minutes. No. 2 is plain paper floated on a sixty-grain solution of nitrate of uranium for three minutes. Both were exposed under the same negative for the same length of time. They are the two halves of a stereoscopic negative. Mark the difference. Light alone reduced No. 1 to what you see it; while the undeveloped half of No. 2 has not the slightest trace of any image upon it, and even the *developed* half is much more feeble than the silver print. As far as uranium is concerned it makes very little difference whether plain or salted paper is employed. No. 3 is a uranium print on salted paper. The paper was immersed in the uranium bath; otherwise the print was treated the same as the developed half of No. 2.

Much may be done, photographically, with uranium, and I have for a long time past experimented with it and endeavoured to utilise it in my business. I have met with both disappointments and surprises. The general experience with uranium printing is a latent image, or, at the most, a faintly-visible one, which must be developed with a solution of ferridcyanide of potassium; but I have succeeded in obtaining a tolerably vigorous visible image—quite as good as a weak silver print on plain paper—*without* development. No. 4 is an example of the visible image. The grey half is just as it came from the printing-frame. The red half was treated with ferridcyanide and washed. No. 5 is a better and unsophisticated example of the non-latent form of a uranium print. On account of the uranium image being much more in the paper than on it I have made many experiments with the hope of producing a brighter picture. Nos. 6 and 7 will illustrate the results. I have obtained uranium positive prints on plain, salted, albumenised, and gelatinised papers, examples of which I place before you; and, in consequence of the general colour being red and the picture more in the paper than on it, I thought that good paper negatives could be obtained with uranium. Here are examples. I thought the uranium negatives would be better than silver negatives on paper; but that is not the case, as the silver negative from the same transparency will show.

I have worked with uranium in water, alcohol, ether, size, starch, albumen, and collodion, and obtained pictures on paper, glass, wood, and ivory; but my greatest success has been on canvas. This example was produced with a collodion emulsion of uranium. The exposure was very short—merely while I held it in my hand in sunshine. The developer was ferridcyanide of potassium. For some time I almost despaired of producing a collodion uranium picture on canvas, it was so difficult to prevent the prepared *ground* from working up with the emulsion; but by previously coating the ground with starch I overcame the difficulty.

I think I have exhausted the list of the photographic usefulness of uranium, and will now endeavour to point out its uselessness.

It is useless to add uranium to the printing bath with the hope of obtaining any beneficial results, and I think that fact has been sufficiently proved by the unenviable *soubriquet* of "worthless type" having been bestowed on the Wothlytype process.

It is useless to add uranium to collodion, for neither delicacy, density, nor rapidity is obtained thereby. The negative now shown exhibits a deficiency in all these desirable qualities. One half of the plate was coated with ordinary bromo-iodised collodion, and the other half with a portion of the same collodion with six grains of nitrate of uranium added to one ounce. The plate was sensitised in the usual working bath, exposed in a twin-lens camera for ten seconds, and developed with iron.

It is worse than useless to add nitrate of uranium to the negative bath, as all the examples I now lay before you will show. I have tested the urano-nitrate bath against the ordinary silver bath in all conceivable ways, and tried it in all proportions from two to fifteen grains to the ounce; I have worked with various collodions, and have rung all the changes of mixing; I have added nitrate of uranium to old baths and new baths, to plain solutions of nitrate of silver, to iodised solutions, and to solutions containing nitrate of barytes; and I have tried it in the developer without being able to arrive at any other conclusion than that the addition of nitrate of uranium to the negative bath, or any of the solutions employed in the wet process, is a delusion and a snare. J. Werge.

## THE CHLORIODO-BROMIDE PROCESS.

Allow me, through your columns, to thank Mr. M. Carey Lea for so generously publishing his discovery of such a valuable process as the above, and at the same time giving it, unfettered, to anyone who has the time or inclination to use it. After working most of the already-published processes, and that very successfully, I have come to the conclusion that for an amateur like myself, who has not much time at his disposal, and who wishes to work with a tolerable degree of certainty, there is nothing as yet published equal to it.

I was disappointed with the washed emulsion processes as published in your last Almanac, as in none of them could density or brilliancy be got without the addition of gallic acid, tannin, or some such substance, which, of course, at once does away with the keeping qualities of the emulsion. I do not find that anything of the kind is required by the new process.

When Mr. Lea's process was published (March 12) I made some collodion according to his formula, and, after allowing seven weeks to elapse, I sensitised it with twenty-five grains of silver nitrate to the ounce, subsequently adding cupric chloride as directed by Mr. Lea. After standing about twelve hours it was poured out to set when sufficiently set (in about eight hours) a preservative of tannin, gallic acid, and sugar was applied for about twenty minutes to the pellicle; this was then well washed, and thoroughly dried over a water-bath. The pellicle was then dissolved in equal parts of ether and alcohol, taking about four days to dissolve, and, when poured on to a plate, gave a film which was all that could be desired.

The plates require about three times the exposure of a wet plate as worked by me, and printing density is got by the weak alkaline developer alone, and, indeed, a class of intensity which seems peculiar to the process; for I observe that, with a short exposure and a long forcing development, the high lights are not blocked up as they generally are under those circumstances with other forms of emulsion plates. The defect of "blurring" is not to be met with in plates coated with Mr. Lea's emulsion.

With regard to the difficulty in emulsifying experienced by some of your correspondents, strange to say I have no difficulty whatever. I use a ten-ounce bottle for three ounces of collodion, and apply the alcoholic solution of silver nearly cold. I think if a bottle of sufficient size be used there need be no difficulty in emulsifying.

Very good results may be obtained by using only seventeen grains of silver, adding no *aqua regia*, but applying a preservative as above. These plates are very little slower than those with silver in excess, and the negatives appear the same in every respect.

I am of opinion that, were our other emulsion authorities as free with their formulæ as are Mr. M. Carey Lea and Mr. H. Cooper, they would have been much more deserving of the praise and honours that have been, and are being, lavished upon them.

I enclose you a few prints from negatives by the new process, and also my card. G.

## ON A NOVEL SYSTEM OF MASKING, AND THE PRODUCTION OF BRILLIANT PRINTS FROM WEAK NEGATIVES.

[A communication to the South London Photographic Society.]

I wish this evening to bring before your notice a novel system of masking negatives for printing for the purpose of producing brilliant and vigorous prints from weak and indifferent negatives; but I do not put it forward as anything new, although I have not seen anything published relating to it. In my own practice I have found it of great value on many occasions through being able to increase or decrease the intensity or printing power of any negative at pleasure without altering or endangering it in any way whatever.

In the first place, we will suppose we have a negative that has been varnished, and on printing we find it so thin that it is impossible to get a presentable print from it, either by printing in the shade or by using highly-salted paper and a strong exciting bath. With the most skilled operator a negative will sometimes turn out in this way, and in some instances it is not possible to get another negative of the same subject. Now, if we carefully study the negative, we will find generally that the contrasts are not great enough, which causes it to print flat. There are many ways of giving more intensity to varnished negatives, but I consider it is always attended with great risk, and is a messy affair at the best of times.

The system I adopt is this:—I print a proof in the usual way on either saxe or rive paper. I prefer the former, and print a little darker than usual. The paper should not be salted with less than twelve grains of chloride of ammonium excited on a sixty-grain bath, although an eighty-grain bath is preferable. It should not be printed to obscure the high lights. Tone *slightly* with gold in the usual way. I know some will say that toning is not requisite, but I find that I get a little more density by it if not carried too far; if it be carried on to the black tones it loses its non-actinic power and colour, whereas slight toning seems to increase it. From this paper print, after being spotted out in the usual way (waxing is not needed), print a paper negative in the printing-frame. I must here mention that if the original negative in the first instance be a very

thin one the paper positive, before being used for printing the paper negative or mask, may have the shadows strengthened with indian-ink. If only a slight intensity be required this strengthening can be dispensed with, and the depth of printing the paper mask is regulated accordingly. I also like to tone slightly. When dry lay the original glass negative over this paper negative mask so that everything coincides as nearly as possible, and trim in the usual way. If trimmed at this stage it saves trouble. Wet it to cause it to expand, and just press it between blotting-paper to take up the superfluous moisture. Run a margin of thin glue of about a quarter of an inch round the edge of the paper, and then place the bare glass side of the negative on it, taking care to keep an exact margin all round the glass. When dry it will be strained perfectly flat like a sheet of drawing-paper on a board.

On looking through the negative from the varnished side one will be surprised to see how the negative has improved in quality and in general appearance. Before doing anything more to the negative it is best to print a proof. In some instances it will be found to give all that is needed, but sometimes the negative is now too intense, which can be easily altered. Lay it, varnished side down, on a table, and give the paper negative backing a coat of castor oil dissolved in twice its bulk of ordinary methylated spirits with a flat brush, which will render it more transparent. I consider the oil and spirit better than white wax when it has not to come in contact with the silvered paper for printing the proofs. On printing another proof, if this be found to give too hard a print, it will be best to print another paper negative mask not quite so deep. This system may be applied to a negative which has been over-exposed and fogged, and will not give a decent print in the ordinary way.

Another point I think worthy of attention: it seems to do away with a vast amount of the so-called retouching. These retouched prints put one in mind of the French and German lithographic prints we see in the shop windows, which seem to have nothing natural about them. The only legitimate use of retouching is to supply that in which photography falls short, such as freckles. I find this system of masking seems to meet these shortcomings to a great extent.

Another point I also consider worthy of note, especially in landscapes: sometimes the foreground prints black and heavy, and at the same time the negative possesses abundance of detail, although not strong enough to print. Print a proof and paper negative, and mask as in the first instance; if it be the foreground that requires the strength lay the paper mask down on a sheet of glass, albumenised side up. Take a brush charged with a strong solution of cyanide of potassium, and go over all the parts except the foreground, which must be left untouched. All those parts will be eaten away and leave the paper quite white; it must then be well washed and attached to the glass negative as before described. If the sky do not print white enough, or if it be stained, I take the paper positive before printing the negative from it and treat it in the same way with the cyanide, which will cause the negative mask to print very dense so as to completely mask the sky. I believe this to be a very efficient and neat system of masking out a sky when required.

We now come to a negative that is very hard, but possessing abundance of detail. By using a positive print instead of a negative mask matters will be found to improve. I think Mr. S. Fry, some years since, spoke of a method of using a glass positive for this purpose to give a softer print. If the negative be a valuable one it is best, after the masking is correct, to fasten a sheet of glass over the mask to protect it from dirt and injury.

In these remarks I do not recommend photographers to take negatives at random regardless of intensity, thinking they can mask it up to supply the shortcomings of slovenly manipulation.

W. Brooks.

## ON THE USE OF PHOTOGRAPHIC AND CHEMICAL APPARATUS.

### CHAP. XII.—ON CUTTING, DRILLING, AND WORKING GLASS.

The attainment of a moderate amount of skill in the various manipulations required in connection with the many glass utensils and pieces of apparatus which even the most elementary laboratory possesses will, above all others, be found so useful an accomplishment, and often so great a saving of time, temper, and expense, that it cannot be too earnestly impressed upon the student that he should lose no opportunity of becoming proficient in all the necessary operations in regard to it. This final chapter of the series will, therefore, be made as explicit and copious as possible, even at the risk of appearing, on the one hand, too diffuse, and, on the other, of seeming to go beyond the scope of these chapters, in order that on every available occasion all the broken utensils possible may be utilised, and every piece of apparatus of a simple class be put together by the operator himself. It is surprising how much time is saved, and often at some critical moment the loss of an experiment avoided, by the useful adoption of a bit of tube, &c., fashioned into shape by a handy manipulator. Again: it makes a serious inroad on the purse of a not over rich student if he is to purchase all those simple pieces of apparatus which the possession of a little skill would enable him to make himself from, one might almost say, a few pennyworths of glass tube. At the same time it is not to be thought for a moment that the student either could or would find it desirable to make every thing he requires to use; it would be foolish to attempt it, and such work only will be suggested here as it will really be desirable to perform.

*Cutting Glass.*—This operation will be in constant request for a variety of purposes—cutting tubes, taking the end off broken retorts or flasks, dividing broken bottles, &c., &c., the proper method of proceeding being dependent upon the shape and thickness of the part to be cut. Tubes are easily broken with an even, smooth fracture after first filing a deep scratch on one side by means of a three-cornered file. The tube should be firmly grasped by both hands, the file-mark turned away from the body, and the thumbs, just touching one another, applied to the opposite side immediately behind the mark. Upon firmly pressing outwards with the thumb, and slightly pulling asunder with the two hands, the tube will snap at the scratch with a sharp, clean edge. If it be likely to be handled much at the cut edge it must be rounded off either by heating in the manner to be described, or by taking the edge off with a file, &c., for the edge cuts like a sharp knife and would soon wear through a caoutchouc connection, besides being likely to injure the fingers. A glazier's diamond may be used instead of the file; but it is difficult to hold it at the right angle for cutting. Whether file or diamond be used care must be taken not to press too much upon the tube, especially if thin, or it would be crushed to fragments at the spot.

If the shape of the article to be cut be such as to preclude the use of the file, a most useful and handy method will be found in "leading a crack," as the process to be described is termed. If the vessel to be cut have not a crack one must be made by scratching it deeply with a file, and applying a burning pastille or a hot iron, which will start a small crack. At a little distance from the crack a line made with ink or French chalk is to be drawn all round, to indicate where the partition is to be made. The next step is to provide some blunt-pointed object at a red heat. Pastilles [see formula] are the best for the purpose; but a piece of tobacco pipe, a thick skewer, or anything of suitable size that can be made red hot will answer. It is better to provide two such substitutes, and then one can be heating in the fire while the other cools in being used. The burning pastille (or its substitute at a red heat) should be applied, touching the glass about an eighth of an inch in front of the crack, which will at once be observed to extend to the ignited point. The latter should then be gradually advanced, and the crack will follow it, so as to meet the ink line at an angle of about forty-five degrees. Pursuing the same course, repeatedly renewing the heater if the pastille be not used, the crack will be made to follow all round the vessel till it almost meets the place where it was first led to the line. It never quite meets, but with the slightest exercise of pressure the vessel will snap off, and leave a slight projection, which can readily be filed down by means of a file wetted with turpentine, and the same means can be used for removing any other inequalities that may have been formed; though, with care and practice, the cut may be made as sharp as if it were done with a diamond.

The process is inapplicable in the case of very thin glass, as well as in that which is not sufficiently annealed; and, if the glass be not very thick, it may be found that the leading will be required to be done by degrees, holding the heated point at a slight distance in advance of the end of the crack, and cooling the glass again after each step it has made.

The pastilles are simply thin sticks, made by converting charcoal into a paste with mucilage and then put aside to dry. Gum tragacanth is the best to use, and should be made into a thin paste with water, and have about half its weight of gum benzoin dissolved in spirit mixed with it. Finely-powdered charcoal may then be added till a soft yet tenacious mass is formed, which should be well mingled and beaten together in a mortar, and then rolled out into sticks the thickness of a quill. The chief use of the benzoin is to impart a pleasant smell when burning. The sticks are best dried by laying them in a warm place on a tray sprinkled with charcoal dust.

Another excellent method of parting a glass utensil in the middle is to slip a piece of strong string once round, holding one long end

in one hand and attaching the other to some strong support, and then moving the vessel backwards and forwards as quickly as possible, when the friction will cause it to become almost red hot. It requires then to be instantly plunged into cold water, when it will crack in two at once. The difficulty of this process is the restriction of the action of the string to as narrow a line as possible; this, however, can be well done by forming a groove for the cord to work in by tightly encircling the bottle on each side of the line with a few folds of thick string, thus leaving a channel of bare glass.

A plan now much less frequently used than formerly, yet still very useful, for cutting off necks of flasks and retorts is to slip a heated ring of iron on to the place to be cut, and then, after allowing it to remain a minute or two, to plunge the heated part in cold water the moment the ring is removed. This method is only serviceable when the ring is almost the same diameter as the place to be acted upon, and, of course, is entirely inapplicable to any but round vessels. The rings are generally made from a piece of iron rod by bending each end into a circular shape, making one larger than the other, and leaving several inches of unbent rod to serve as a handle.

Another method is to tie a string dipped in turpentine round the vessel, first placing it on its side, then to set fire to the turpentine, turning the vessel round all the while. After allowing it to burn for a few seconds it is dipped in water, and will then generally part at the spot; but it is very liable to give an uneven fracture, owing to the spreading of the heat.

*Piercing Holes.*—The quickest plan, and the one usually recommended, is to use an ordinary steel drill and bowstring, keeping the point well wetted with turpentine. Before beginning to rotate the drill it is necessary to make a scratch on the glass with a file point or a diamond, to enable it to "bite;" but, for occasional use, an ordinary brad-awl can be made to answer every purpose. It should be used in just the same manner as for boring a hole in a piece of wood, only that the point must be kept wet with turpentine. In all operations with steel instruments upon glass turpentine should be used, and it will be improved for the purpose by having dissolved in it a few grains of common resin. This method of piercing holes will be found most useful in removing a glass stopper which has become irrecoverably fixed in a bottle; the hole is first to be made, and then the glass can be snipped and broken away all round it.

G. Watmough Webster, F.C.S.

## THE ADVANTAGES OF SULPHOCYANIDE OF AMMONIUM AS A FIXING AGENT.

[A communication to the London Photographic Society.]

In order to be explicit in communicating a few remarks upon the above subject I have thought it advisable to divide the same into five headings, as follows:—First, to consider the matter historically; second, chemically; third, theoretically; fourth, practically; and, fifth, economically.

Sulphocyanide of ammonium, as a fixing agent both for prints and negatives, was first made known to the photographic world by M. Meynier, of Marseilles, who laid the matter before the Society, and succeeded in getting an experimental committee appointed to report upon the subject as far back as the 9th January, 1863. This report was given about three months later; and on the 22nd of the same month a very interesting and practical paper was read before the late North London Photographic Association by Mr. G. Wharton Simpson. During the twelve years that have elapsed little has been said upon the subject; and, in order that it may not collapse until it has been much more fully investigated than has yet been the case, I have thought it advisable to bring it prominently and forcibly before the Society, in hopes that our practical and experimental members will take the matter up with spirit, and decide definitely which is the most perfect fixing agent for photographs—hyposulphite of soda or sulphocyanide of ammonium. Having the conviction that the immediate future of photography lies more in the perfecting of the *silver* process than in the adoption of *carbon* printing (I mean for small work and small commissions) I feel it an important step in the right direction if we can find an agent that shall more thoroughly dissolve out the silver left in the prints after toning than is the case with hyposulphite of soda. It is my conviction that photographers generally have stuck to the use of hyposulphite of soda chiefly on economical grounds; but, if it can be shown that this substance, by a very general consumption, can be produced at a price that will favourably compete with hyposulphite of soda, this consideration will be entirely swept away, although I must add that I think it is one that should always be held as of very secondary importance.

I shall now say a few words upon this substance chemically. It is a notorious fact that many disputes arise in our photographic journals through very different results being obtained by the same formula, whereas the solution of the problem is simply in the fact that one person is using everything of the purest kind while the other party has a very inferior article; and I was informed by Mr. H. Cooper, only last December, that a certain process of obtaining good albumen transparencies for enlargement was an entire failure in the hands of many who had purchased a certain process, simply on account of the difficulty of obtaining the purest albumen in country towns.

Perhaps I cannot better illustrate the above remark than by the three samples of sulphocyanide of ammonium I have laid upon the table, obtained from two different manufacturers. One I have marked as an *impure* sample, another is shown as the *crude* sample, and the third as the *pure* article. Now the first of these has such an excess of sulphur left in it that it makes it impolitic to use it at all as a fixing agent for prints. I found it answer for negatives instead of cyanide of potassium; but considerable washing and a second application are required. Not so the other two samples. Sulphocyanide of ammonium is composed of sulphur, hydrocyanic acid, and ammonia, and is obtained by neutralising hydrosulphocyanic acid with ammonia and evaporating gently to dryness, or digesting hydrocyanic acid with sulphide of ammonium and boiling off any excess. There are various other ways, but this is how it may be obtained in the laboratory.

I shall next touch upon it theoretically. That sulphocyanide of silver is formed by the immersion of the toned prints is the *primary* action, and that a double salt is afterwards formed through the excess of sulphocyanide of ammonium is the *secondary* action, and that a certain small amount of sulphocyanide of silver (which is insoluble in water) may ultimately remain in the prints is the *final* result.

This leads me to my fourth heading, namely, the consideration of it in its practical bearings; and the following question naturally arises—Supposing, for the sake of argument, a small trace of undissolved silver be left in the prints, which is the lesser of two evils—to have a small portion of sulphide of silver left in the prints, or a small amount of sulphocyanide of silver? Although this may be a somewhat difficult question to settle off-hand, yet I ask whether some of our experimental chemists cannot decide the matter for us definitely, and even find a substance that shall be capable of entirely dissolving out this objectionable product, and yet leave the print in possession of all its beautiful qualities as regards tone and brilliancy.

However, it is open to dispute whether there is really the slightest trace of sulphocyanide of silver left in the print when the operation of fixing has been carefully and properly conducted; and on this point I shall quote rather fully from MM. Davanne and Girard's researches, who were two of four gentlemen appointed as an experimental committee to test the properties of sulphocyanide of ammonium as a fixing agent, and who, trying its action upon albuminate of silver, found that it was much more energetic as a fixing agent than hyphosulphite of soda.

"If a certain quantity of albumen be precipitated directly by nitrate of silver, and, after the precipitate is washed and treated two or three successive times by sulphocyanide of ammonium, the residue carefully washed, we recognise that this residue, dried and calcined, leaves only very *minute* quantities of silver in the ashes; whilst in operating in a similar manner with hyposulphite of soda the ashes contain, relatively, *considerable* quantities of silver. The sulphocyanide of ammonium appears, therefore, to present a real superiority over hyposulphite of soda in respect to the absolute fixing of the whites of the prints."

Again: in another article M. Meynier states thus:—

"Sulphocyanide of ammonium dissolves the silver compounds employed in photography very readily; and its most remarkable property with respect to the permanancy of the pictures *is* that, notwithstanding the presence of sulphur among its elements, it does *not* precipitate that element under the action of acids, which is the primary cause of the fading of prints fixed with hyposulphite of soda. To verify this property a saturated solution of hyposulphite of soda was placed in one test glass and a saturated solution of sulphocyanide of ammonium in another. A drop of acid added to the solution of hyposulphite of soda caused an *abundant white precipitate* of sulphur. The solution of sulphocyanide of ammonium similarly treated, on the contrary, remained *limpid*. This limpidity was not changed under the action of a very strong proportion of acid. The liquid only became feebly coloured yellow-red. From these facts it evidently results that sulphocyanide of ammonium does not precipitate sulphur under the influence of acids; and, admitting that some sulphur must be liberated, soluble compounds only are formed, which will be removed by washing, and leave no sulphur in the substance of the paper."

Again: in a very comprehensive article upon the same subject, published first in the *Bulletin* of the French Photographic Society, and afterwards in the *Photographic News* of May 1, 1863, we find the following remarks by MM. Davanne and Girard, beginning with the question:—

"Can sulphocyanide of ammonium dissolve all the silver compounds? We have no hesitation in replying in the affirmative. For a long time it has been known that the alkaline sulphocyanides dissolve the salts of silver. This fact is recorded in all treatises on chemistry; but experiment has shown us that its solvent faculty is more absolute than that of hyposulphite. The action of this salt upon nitrate and chloride of silver is more decided, as everyone may ascertain for himself. Take a solution of nitrate of silver, and pour into it some drops of the alkaline sulphocyanide, a white precipitate of sulphocyanide of silver will appear; upon your adding an excess of the reagent the precipitate will quickly disappear. Chloride of silver shaken into a solution of sulphocyanide is dissolved in the same manner.

"The clearness of these two reactions admits of our passing them over quickly; we therefore devoted all our attention to the solution of albuminate of silver. We recognised that the solution was complete, and that the action of the sulphocyanide was, from this point of view, even more energetic than that of hyposulphite of soda. For, on the one hand, we precipitated some albumen by nitrate of silver; then, after well washing the precipitate with distilled water, we treated several times one portion with sulphocyanide of ammonium, the other with hyposulphite. Again well washed the precipitates were well calcined. That which had been treated with sulphocyanide furnished *traces* of silver only; whilst that treated with hyposulphite furnished a *considerable* quantity. On the other hand, we fixed, by means of these two agents, some albumenised paper, which we afterwards burned; and in this case we recognise a difference of the same kind quite favourable to the employment of sulphocyanide, but which was less marked than in the first case. Thus sulphocyanide attacks albuminate of silver more energetically than hyposulphite, and, consequently, presents a decided superiority over the latter with respect to the absolute fixing of the whites of the prints."

Sulphocyanide of ammonium, in conjunction with chloride of gold, makes an excellent toning bath, the best proportions being six grains of the former to each grain of gold. The fixing bath should be used very strong—say one part of sulphocyanide to two parts of water; and, whilst the first should be thrown away after the prints have remained in five minutes, the second bath of the same strength may be preserved, in order to be used as the first bath for the next batch of prints. Five minutes in each bath will be found sufficient, provided that the prints are well washed between the two fixings. It has been proved to be more economical to use a solution of this strength, and it will not be found to reduce the prints more than the ordinary hyposulphite bath.

For fixing negatives sulphocyanide of ammonium is to be strongly advocated in preference to cyanide of potassium or hyposulphite of soda.

Make a saturated solution and keep it corked. It will be found as energetic as cyanide—no offensive smell; and most authorities declare it to be innocuous, though upon this point I cannot speak positively, and do not care to try the experiment just yet.

Lastly: a few words upon economical grounds, as compared with hyposulphite of soda. Although, as I have stated before, I consider this a secondary matter, yet we can live *in* hopes, if not *upon* hopes. Hyposulphite of soda was once a guinea a pound, and is now less than a guinea per cwt.; but this is not so much on account of the *few* tons used by photographers, but by the *many* tons used by calico-bleachers and paper and cardboard manufacturers.

Sulphocyanide of ammonium can be produced from gas refuse in large quantities—in fact, gas-liquor is at present thrown away as a useless article; but, if some enterprising firm will only take the matter up and make a few tons, there is little doubt that it would entirely replace cyanide of potassium and, to a great extent, hyposulphite of soda. Sulphocyanide was sold in Paris twelve years ago at about 1s. 1½d. per pound; and although one sample upon the table cost 3s. per pound, and the pure sample 4s. per pound, yet I consider the latter the cheaper of the two on account of its purity. But there is no reason why it should not be greatly reduced in price if photograpers will only "wake up" and use it generally. I have been informed by Mr. John Williams that a patent has recently been taken out for making Prussian blue from this material; and if a really good blue be attainable, which appears very probable, there is little doubt but that sulphocyanide of ammonium will come down in price to about 4d. per pound, instead of 4s. per pound.

In conclusion: I ask the opinion of photographers generally whether sulphocyanide of ammonium is not a more perfect fixing agent for prints than hyposulphite of soda when properly used; and whether there is any necessity whatever for the continued use of that objectionable, poisonous, and evenly costly chemical, cyanide of potassium, for the fixing of negatives.

Why not banish it from our midst? Only try sulphocyanide of ammonium and I feel confident this will be the result. Then we shall have no more heartrending stories of accidental or non-accidental death by poisoning with cyanide of potassium, the manipulatory part of the art will be made less unwholesome, and all these advantages will be realised without a single disadvantage to counterbalance the recognised gain. G. Hooper.

## FOREIGN NOTES AND NEWS.

The Berlin Photographic Society.—Is the Photographic Picture Formed In or On the Collodion Film?—Iron Developers. —M. Leipold on Stippling Lichtdruck Printing Films.

There was a discussion at a meeting of the Berlin Photographic Society as to whether a photographic image was produced *on* the surface of the collodion film or *in* the film.

Herr Quidde said he had been convinced against his will that it was merely formed on the surface of the film and did not penetrate it to any great extent. What convinced him was the result of the following experiment:—Once, when he wished to obtain a reversed negative, he exposed a plate with the collodionised side furthest from the lens. A little of the silvering fluid had got upon the glass side of the plate, and, throwing a shadow through the film, had a disturbing influence upon it, causing it to be cloudy—that is, to have thick and thin places. If the image be only produced upon the surface of the film which is exposed to the action of the developer, then, in the position in which this plate was, it is evident that the rays of light had to pass through the film to reach that surface before they came into action, and that they would be weakened by so passing through the film. The result of the experiment fully bore out this hypothesis. Before the plate was fixed it looked pretty equal; but after it was fixed the picture was very perceptibly strong where the film was thinnest, and weak where it was thickest—quite the reverse of the usual state of matters.

Herr Linder was also of opinion that the picture was only formed on the surface, and supported his argument by a quotation from Grüner's way of transferring collodion pictures to wood, in which an instance is given of the whole of the collodion film being washed off without injury to the picture.

The President was of opinion that the picture is formed *in*, and not *on*, the film.

Herr Hartmann asked if it would not be possible, by placing several films one above another, to obtain a transverse section, which could be examined with a microscope, and so decide the question.

Dr. Schimann undertook to make the microscopic examination.

The remainder of the time at that meeting was principally occupied in discussing that ever-recurring topic—iron developers. This time it was brought up by Herr Quidde remarking that he had several times tried the dioxide of iron ammonia, mentioned in Messrs. Rottier and Waldack's article in the *Archiv* on iron developers, but got insipid pictures with it.

Herr Linder used equal parts of sulphate of iron and dioxide of iron ammonia at a strength of 1·30, and was much pleased with the result. He was of opinion that the strength and condition of the silver bath, as well as the developer, has a great influence upon the formation of free particles of silver in the picture.

The addition of acetic acid to the developer along with sulphuric acid seemed to have become an established custom with most of the members present.

Herr Quidde said Dr. Vogel's formulæ worked well. They were—

*For Portraits.*

| | |
|---|---|
| Sulphate of iron | 5 parts. |
| Glacial acetic acid | 3 „ |
| Water | 100 „ |

*For Reproducing Engravings.*

| | |
|---|---|
| Sulphate of iron | 2½ parts. |
| Acetic acid | 3-4 „ |
| Water | 100 „ |

Herr Schaarwächter used as little liquid as possible in his developer, in order to keep the silver on the plate better together. He worked with the following:—

| | |
|---|---|
| Water | 1,500 grammes. |
| Sulphate of iron | 65 „ |
| Acetic acid | 30 „ |

The President remarked that when acetic acid was used it was seldom necessary to add alcohol, as the acid completely replaced it;

but when sulphuric acid was employed it seemed almost indispensable, as it was scarcely possible to get the developer to flow equally without it. Rottier and Waldack's article (which is not yet finished, however) made no mention of several iron developers, such as Monckhoven's.

Herr Boll added potassic nitrate to his developer, for which the following is the formula:—

| | | |
|---|---|---|
| Water | 3,000 | grammes. |
| Sulphate of iron | 85 | ,, |
| Dioxide of iron ammonia | 85 | ,, |
| Potassic nitrate | 17 | ,, |
| Glacial acetic acid | 35 | ,, |
| Alcohol | 165 | ,, |

Herr Jacobeit named carbolate of iron as an excellent, but not yet very well-known, photographic developing medium. A developer charged with it required the shortest exposure of any that he knew of. Several persons who had tried it, not expecting much from it, ended by adopting it altogether. The formula for it is—

| | | |
|---|---|---|
| Water | 500 | grammes. |
| Carbolate of iron | 25 | ,, |
| Acetic acid | 10 | ,, |
| Alcohol | 35 | ,, |

An article in the *Photographische Archiv*, from the pen of M. Joseph Leipold, Superintendent of the Government Printing Establishment at Lisbon, contains some suggestions for the improvement of the lichtdruck and heliographic processes. M. Leipold introduces his subject somewhat lengthily by considering the progress made during the last few years in the application of photography to printing in inks. He passes in review the lichtdruck process, by which coloured prints have been obtained that so completely reproduce the half-tones of the photograph direct from nature as to be scarcely distinguishable from prints upon sensitised albumenised paper; photography applied to lithographic printing—a great assistance to the production of printing-stones of linear drawings; Rousselon's new process for printing with fatty inks; and the latest improvements in heliography introduced by Baldus, Mariot, Scamoni, &c. Some of our readers may remember that, a short time ago, M. Leipold himself published a heliographic process. He then expressed a hope that he would not be considered a mere carping critic if, notwithstanding the rapid advance of late in this direction, he considered those processes capable of still further improvement. Lichtdruck, for instance, charming as its productions were, had not yet been able to take a place as a means of illustrating books, magazines, and journals of all kinds alongside of that long held by woodcuts and steel and copper engravings, nor even of that gained and maintained by lithography. The greatest drawback of lichtdruck printing was that even an experienced printer could not anticipate with any certainty the number of proofs that the gelatine film fixed to glass was capable of giving off. But, though the process might not on that account be adapted for illustrating books of which large editions were likely to be required, it was suitable enough when comparatively few copies are likely to be needed; and M. Leipold was not prepared to say that, if the negatives were multiplied, it would not in time entirely supersede the tiresome process of copying upon chloride of silver paper. Another fault he had to find with the lichtdruck process was that in most of the prints he had seen the picture wanted softness; it was also monotonous and flat. That seemed to be principally occasioned by the want of transparency in the deep shadows. Of course they might be told that this want of variety in the lights and shadows was as likely to be attributable to an imperfect original negative as to the defects of the prepared printing plate; yet, making every allowance for the imperfections of the negative, M. Leipold was persuaded that the results of lichtdruck would be much improved if a strong grain could be produced in the printing film by the introduction of some suitable substance, such as chromic salt, into the gelatine, as that would not only increase the softness of the picture, but bring the lights and shadows into better harmony. How far that was applicable to lichtdruck remained to be seen. But Pretsch, the inventor of photogalvanography, said that the addition of iodide of silver to gelatine produced a useful grain which could be so manipulated as to be coarse or fine as desired. Would not iodide of silver have the same effect added to gelatine intended for lichtdruck? Another way in which some had tried to obtain the desired grain was by dusting finely-powdered graphite upon the developed picture, and giving the surface a number of dabs, the strokes being of equal force, with a not very hard brush held perpendicularly over the picture, as house painters produce a dead stippled surface on an oil-painted wall.

Some experimentalists obtained a delicate grain by mixing powdered glass with gelatine; others utilised the carbon paper used for printing in colours; and others, again, produced a grain by laying a very thin, transparent tissue between the prepared plate and the negative. Further, according to Professor Husnik's latest experiments, a grain could be produced by mixing chloride of calcium with the glue. If graining or stippling would improve lichtdruck prints, M. Leipold says, from all those different ways of producing it printers would surely be able to choose one adapted to their needs.

## OUR CLUB.

### No. V.—Tom Cooke on Burnishing.*

"And now, gentlemen, I come to the question tonight of how your studios and waiting-rooms are kept, and how in many cases they might be improved. With regard to houses that are badly kept, I remember once standing on the green turf outside of a glass-house, and as I looked through the dim and dirty glass I could see the side slips hanging on the angle between floor and ceiling. as if in their too hasty descent they had been caught by a nail and detained there; I could see the blue blinds hanging down here and there all over the place, filled with dust, untouched and uncared for; I could see the once white blinds grey and patched over with red iron spots and damp stains—all repeating the story of neglect. As I stood gazing on this picture, which, with propriety, might have been termed the 'road to ruin,' I said to myself—'Is this an artist's studio?' I ventured into this sanctuary of the sun, thinking as I went. 'For if the Sun, being a god,' shine down upon the fairest-kept place, so with equal bounty does he shed his honours here; and so from this standpoint you all have equal chances in the race. Nature supplies the same quantity and quality to all, and he who makes the best use of it is rewarded by producing the best results. Well, I ventured into this studio, and at the first step (over a hot water-pipe which crossed the doorway) I was sent sprawling *all my length* upon the floor—not much, but enough.

"The happy inmate of this palace sat in front of a stove behind a short cutty pipe, cleaning the mud spots off the plate glass fixed in a printing-frame. As I was gathering myself together he leisurely removed the pipe from his mouth and said—'You're in a hurry this morning, Mr. Cooke. Although so little you make considerable noise. I am of opinion that you carry your head too high for the safety of your body.'

"'An awkward place for a pipe,' I replied, in anger.

"'Pipes must always be somewhere,' he replied, placing his cutty in his mouth with a smile. 'Sit down,' he continued, pointing to the box of a dark tent which lay in the middle of the floor.

"Yes, there was a chair—a posing chair—in the studio, but it was engaged; an open box of negatives lay on it. There was a pedestal, also; but the cat slept on the top of it. There was a dirty little table, on which lay a packet of silver, open. He had, perhaps, taken out as much as served him for his bath, and the parcel was left neglected. A hammer, a saw, printing-frames, packets of mounts, and packets of glass were strewn all over the place. It looked as if such materials grew upon the premises, and as you walked you had to pick your way, so as not to disturb or break the plants. It was, from every point of view, a *hot house.*

"As I was sitting there a customer arrived, and then was'nt there a scurry to put the place into something like order. The cat was no longer left to enjoy *still life*, but was sent spinning. I was hurried into a small room where the printing was being done; and this room was quite as prolific in 'plants' and odd things, seeming to spring up from every corner, till one felt as if there was scarcely breathing room left. It was so utterly neglected that I had but to suppose that the genius of the place aspired to higher things. And, do you know, this man, in the midst of this mess, could manage to take a 12 × 10 plate without a speck on it. It really was a marvel to me how he did it; but he seemed to dodge the dirt and dust wonderfully in the working of his plates.

"Now, in our profession this class of house—and there are many such—should not be, and, for our own credit, such a state of things should not exist. Why, if we set our minds to it, it is an easy matter to keep our places at least clean and tidy, giving them an inviting, cheery appearance. I have entered a waiting-room where, on looking round, you could perceive at a glance that every picture, every frame, had had attention and care bestowed on it; where a vase of flowers stood upon a centre table fresh and blooming; where the window blinds were arranged to throw a soft, pleasing light which induces repose in those who come to sit. I have gone from there into the studio, where everything was arranged for comfort and ease, both for the operator and the sitter—furniture and backgrounds so fixed that any style of picture could be produced with the least possible amount of trouble; and from there I have gone to the dark room, where the cool, damp, dustless feeling makes one eager to try the working of a plate, the very atmosphere breathing success.

* Concluded from page 250.

"And so my friends I would have you

"Look here, upon this picture and on this—
The counterfeit presentment of two studios;
See with what care and taste this studio here
Is kept; a place for everything in use,
For every needed thing its proper place.
The sunlight fills the room, cheerful and bright,
Each polished point reflects again the light;
No mass of dust comes floating on the air—
What pleasure and what comfort working there!
In waiting-room the mellow light subdued,
The perfume of fresh flowers on entrance greet
Each visitor, who, unknowing, the habit dons
Which pleasing impress gives to human face divine.
In closet dark where we our magic work,
And raise loved forms to please and gratify,
This little den's in perfect order kept,
So that moving with closed eyes one could
His incantations work.
This is the place. Look you now on this:
The bright sun from without seeks through the damp
And dirty glass to cast reflections on
The dirt and damp which coateth all within.
Disorder the fixed order of the place—
A place for everything, yet nothing in its place.
A waiting-room, neglected and mildewed,
Hair growing up from seats of broken chairs;
On walls chipp'd frames and faded pictures hang.
A litter of fair faces spotted o'er
With finger marks and dust on table strewn.
A little room for working out the spell,
Dark in its arrangement as in its light—
A problem it, unsolved by him who made it.
And so from day to day he picks his way
'Midst failure and success, where success sure
Would greet him, if he a little care bestowed.

"Judge of the two pictures, friends, and go put your houses in order." MARK OUTE.

# Meetings of Societies.

## SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE concluding meeting for the present session of this Society was held on Thursday, the 10th instant,—Mr. F. York in the chair.

Mr. William Brooks read a paper *On a Novel System of Masking, and the Production of Brilliant Prints from Weak Negatives.* [See page 293.]

The CHAIRMAN, in tendering a vote of thanks to Mr. Brooks, said that the process advocated seemed to be one of great utility. The hard lines of junction in combination pictures were often very objectionable; but by adopting the method recommended in the paper to which they had just listened these hard lines would be done away with. He could see several ways by which the suggestions could be utilised; he might give as an instance the lighting up of dark foregrounds.

Mr. WILKINSON observed that the matter had been presented in such a shape as to leave no room for discussion.

Mr. BROOKS said that the process was useful in the case of very thin negatives, as well as for imparting artistic effect to such subjects as drapery.

At this stage Mr. Brooks gave a practical demonstration of the method of removing any portion of a picture by means of an application of cyanide of potassium, handing the pictures thus operated upon round the room for examination.

Mr. AYRES inquired if there was not a difficulty in effecting a complete removal of the cyanide of potassium from the print.

Mr. BROOKS said that it could be done by washing well with a brush. There was no danger of the cyanide acting upon portions upon which it had not been applied.

Mr. J. WERGE considered that in this process Mr. Brooks had almost reduced the art of photography to the art of painting. He recommended the application of plumbago by a stump to the back of the negative, as it was more under control. They could distribute or blend it away as they liked. At this point the subject was dropped.

Mr. Werge then read a paper on *Uranium and its Uses.* [See page 292.]

The CHAIRMAN had never tried uranium except as an intensifier with ferridcyanide of potassium, when he found its use not to be commended.

Mr. BROOKS agreed with all Mr. Werge had said respecting the alleged accelerating influence of an addition of nitrate of uranium to the negative bath; the only effect produced was to render it slower.

After some remarks by Mr. Tulley, Mr. Kennett, and others,

Mr. WARNERKE said that if red uranium prints were flowed over with sulphuric acid and bichromate of potash they would vanish; but on being treated with a solution of citrate of aniline they would re-appear of a black colour. A print of a greenish-black colour would be turned into one of a purple colour by solutions of the alkalies.

A vote of thanks was then tendered to Mr. Werge.

Mr. Warnerke then made a communication respecting several matters relating to the utilisation of bromide emulsions on paper instead of glass. This communication was delivered *extempore*, but an urgent request having been made that it should be reduced to writing, and published *in extenso*, it was agreed that it should assume this latter form. We expect shortly to be able to publish this interesting communication, for which the thanks of the meeting were awarded.

The Secretary having intimated that the next ordinary meeting would be held on October 14th, the meeting was adjourned.

## EDINBURGH PHOTOGRAPHIC SOCIETY.

THE third outdoor meeting of this Society was held on Thursday, the 10th inst., at St. Monance, Fife. The members left the Waverley station at 6.30 a.m., and arrived at their destination about nine o'clock. Breakfast, of course, first claimed their attention, and for that purpose they proceeded to McFarlane's hotel, where, in spite of the rather unpromising appearance of the exterior, they were sumptuously entertained.

St. Monance is a quaint, clean-looking fishing village, with a population considerably above the average of such places in appearance and industry, and affords much picturesque work for the camera in the shape of fine combinations of rocks and water; while the harbour, with its fleet of fishing-boats, affords scope for many excellent pictures. It possesses, also, a tolerably-fine ruined castle and round tower, which may be combined, with much pictorial advantage, from several points of view. The glory of St. Monance, however, is its ancient church—one of the oldest in Scotland, and in a pretty good state of preservation. As the sea at high water almost washes its base it is a never-ending source of admiration to visitors, and is always eagerly seized on by all artists, whether they rely on the brush or the camera.

The cameras of the party were very naturally first turned in the direction of the church, and then each betook himself to the kind of subjects most congenial to his taste, or best suited to the size of plate which he was working, and so the day was pleasantly spent till dinner time.

The weather, which looked gloomy and dull in the morning, fortunately took a favourable turn, and the members had the advantage of fine sunshine tempered with masses of white clouds during the whole day. The wind, however, was rather high; but as there were no trees, the only danger was in the possibility of the cameras being shaken, and, judging from the results, that, by the aid of pretty heavy stones, &c., seems to have been generally prevented.

At three o'clock the party sat down to dinner, which was served up by Mr. McFarlane in capital style, and very thoroughly enjoyed. After dinner the members constituted themselves into an ordinary meeting of the Society, the President in the chair, but the business transacted was simply of a routine character. On comparing notes it was found that in all forty plates had been exposed, including Davies's beer and albumen, Captain Abney's modification thereof, collodio-bromide emulsion, and plain beer, and it is said that excellent results were got by all.

The party started on the homeward journey at 4.30 p.m., and arrived in Edinburgh at eight o'clock, very much pleased with the excursion and very hopeful of having secured satisfactory negatives.

We understand that the annual holiday—which has apparently become one of the Edinburgh institutions—is to take place on the 8th of July, and that the excursion will be, as usual, by barge to Almond Dell.

# Correspondence.

## DRY PLATES *VERSUS* CUSTOM-HOUSE OFFICERS.

*To the* EDITORS.

GENTLEMEN,—If Mr. Ross, before he leaves England, will fold each couple of his sensitive plates separately in yellow paper and unite these in larger packages of six or twelve plates, also inscribe on the outside in French and German the nature of the contents and the peril of opening them in daylight, he need have no fear for their safety, for I have in this manner sent many dozens of dry plates to the continent without ill fortune in any single instance.

But, in case he should come in contact with any *douainer* more than usually obdurate, it might be well to have on top of all a package of two spoilt plates as evidence of correct declaration.—I am, yours, &c.,

22, *Red Lion-square, June* 11, 1875. J. SOLOMON.

*To the* EDITORS.

GENTLEMEN,—Having lately been similarly placed to Mr. Ross I beg to suggest that his passport be endorsed with his profession, and that an injunction *in German* be written on the back forbidding certain packages to be opened. I do not think it would be of much avail, but this and the same printed on the boxes containing the plates seem to me the only means against the stupidity of the officials.

Obstinacy in refusing to allow the plates to be examined is, perhaps, the best safeguard. Many of the custom-house people do not know a word of English, so it is best to be prepared beforehand.

My boxes (stereo.) look suspiciously like cigar boxes. This, perhaps, gave me a little more difficulty than might otherwise occur. It is only, as a rule, at offices on the frontier that any annoyance arises, such as passing from Prussia to Holland. In and out of England on either side your word is generally taken.—I am, yours, &c.,

*Liverpool, June* 14, 1875. J. H. T. Ellerbeck.

## RESIDENTS OF VITREOUS ESTABLISHMENTS SHOULD NOT INDULGE IN THE PROJECTION OF LITHIC MISSILES.

*To the* Editors.

Gentlemen,—It is not, I think, a custom with journalists—and in my opinion it is undesirable that it should become so—1. To indulge in a certain style of "reasoning." 2. To allude to that style of reasoning with disparagement. 3. To attribute it, disparagement and all, to some one by whom it was not used.

Such, however, is the course Mr. Batho has adopted. On the 26th of March an article from his pen appeared on continued action "in the dark," in which he tells us, in the case of certain films, "light was perfectly excluded" by their enclosure in a box. In your issue of this week he disparages the kind of "reasoning" which affirms that light is not because no light is seen at the same time, attributing this *his* error to myself, by whom, as will be seen on reference, it really was not made.—I am, yours, &c., D. Winstanley.

*June* 5, 1875.

## GELATINE *VERSUS* COLLODION.

*To the* Editors.

Gentlemen,—I was glad to see the experience of some one else besides my own as to the sensitiveness of gelatine plates. A friend of mine and myself had several trials at the interior of a badly-lighted church with both wet and dry plates, and with varying exposures—never less than an hour—with the most rapid one. After some experience with Kennett's plates we were successful in ten minutes' exposure. One exposed twenty minutes was over-exposed. I do not believe any dry or wet *collodion* process would do the same. The gelatine is so very sensitive to the weak lights that subjects like the above seem to me the best tests for the rapidity of any process. In development I use only aqueous solutions; any alcohol is fatal. I cured the liability of the edges to slip by exposing them to the light of a lamp for a few seconds, shielding the other part of course.

Intensifying in a shallow dish seems best, and my friend prefers to do that after fixing, the plate having been allowed to dry. On again wetting and after slightly flooding with iodine solution you can intensify to any extent you like, should the intensifying previous to the fixing (if necessary) prove too little.

I have great pleasure in giving all credit to Mr. Kennett for this well-worked-out process; for it is simple, free from spots, and exceedingly sensitive. I say—"Try it."—I am, yours, &c., Geo. B.

*Glamorgan, June* 10, 1875.

## WASHED EMULSION.

*To the* Editors.

Gentlemen,—I must ask leave to make my case clear on the point again alluded to by the "Peripatetic Photographer." On November 14, 1873, Mr. J. Johnston, in The British Journal of Photography, published the method of pouring out an emulsion, allowing it to become solid, cutting the solid material in slices, and washing out the free bromide, &c., from it. Now, on this subject several writers have since touched, but in two cases only has Mr. Johnston's name been mentioned—once by Dr. Nicol (January 29, 1875), in these words, in speaking of Mr. Kennett's patent:—"In September, 1871, and in August, 1873, Dr. R. L. Maddox published a method of making such an emulsion; and on November 14, 1873, Mr. J. Johnston not only published a method of making, but also of washing out, the soluble salts in as nearly as possible the same words used by Mr. Kennett six days later in his specification." The other mention was by yourselves, in an append to my letter of May 21, where you very properly put Mr. Johnston's name first in mentioning workers in this direction.

Now, as Mr. Kennett actually patented what had appeared in your columns six days before—and this fact has escaped the notice of most writers on the subject—I think I am right in calling attention to it. I presume also that, whether the emulsion be gelatine or collodion, Mr. Johnston's proposal to solidify and wash holds good.—I am, yours, &c.,

*June* 15, 1875. H. Stuart Wortley.

## MR. W. J. STILLMAN AND MR. M. CAREY LEA.

*To the* Editors.

Gentlemen,—The reply of Mr. M. Carey Lea to my strictures on his new process, while it convicts me of what Mr. Cooper has already shown to be carelessness in computation, says not one word on the main point at issue, and contains a great deal of that supercilious consideration of what anyone else says of subjects which he regards as his own property, which is so serious a drawback in all he writes.

I am always willing to confess my blunders, and that I make a great many. I am a very busy man, and what I write for The British Journal of Photography I have to take time from work of much greater importance to me personally than photography. I have sometimes hardly time to re-read my letters, and since I have lived at such a distance from London I never see proofs of what I write.

But Mr. Lea should have had some better reply to my main charge against his publication of photographic discoveries, *that they are made carelessly, without proper experimental demonstration, and in vague and misleading terms*, than that I am guilty of carelessness in my analysis of his formulæ. The point of my blunder as to iodide of ammonium I have already explained as carelessness in copying, not in calculation; but Mr. Lea will have it that I have made an intentional misstatement in my calculation of bromide of cadmium, as I insist on "dried" cadmium bromide being "anhydrous." I do not know what sense Mr. Lea puts on English words, but when I say "dried" I *mean* dried—that from which the water has been entirely driven off. When I dry cadmium bromide I make it as hot as it can be without danger of decomposition. It is possible that Mr. Lea makes distinctions finer than I can comprehend; but when he said "dried" I supposed *honestly* that he meant that from which the water had been driven off completely.

It is possible, too, that my knowledge of chemistry is much less than Mr. Lea's. It is twenty-five years since I left the laboratory of the university, and of late I have been accustomed to take my chemicals at the hands of the chemists, finding them practically what I wanted. So much for what Mr. Lea calls the "worst case of all."

The *aqua regia* case is one of pure misrepresentation on Mr. Lea's part—I will not say "intentional," because gentlemen are reluctant to use such words when there is any other explanation—but a worse misrepresentation than I made in my whole article. I used the value set down for "hydrochloric acid," which, when of proper strength, contains forty per cent. of the acid gas, and said that an inferior kind had only twenty-eight per cent.; yet Mr. Lea talks of "Mr. Stillman's *data*" as twenty-eight per cent., and makes me out to have blundered because I make my *datum* after my own fashion, and not after his. "Is it possible that" Mr. Lea "can consider this sort of thing legitimate?"

But it is not worth while to insist on points of detail. I do not care to take the trouble to follow Mr. Lea's peripatetic formulæ. If he will take the pains to establish them by comparative experiment before he publishes them we shall not have him writing to correct them as soon as they are printed, because he had not taken care to test his chemicals before he used them, or publishing and claiming processes which he has not yet even tried, and which, moreover, had been already published by others long before, as with his alternative to Mr. Bolton's process. Whatever may be the value of my contributions to emulsion photography I may safely say that I have never rushed into print with anything I had not thoroughly tested in order to secure priority of publication. I have never taken the trouble to "blow my own trumpet," and I am quite indifferent to Mr. Lea's estimate of what I have done.

But with regard to my comments on his albumen and tannin preservative, &c., I have something more to the point to say. Mr. Lea attempts to prove that I misrepresent the facts in two ways—by "ignoring facts universally known," and by misquoting his note on "fibrinous matter." With regard to the latter I am glad to be corrected; but he must blame his own confused and unintelligible manner of stating his numerous and metamorphic processes quite as much as my incapacity to comprehend him. I did not allude to any particular passage; but the term "fibrinous matter" struck me as a good one, and I did not mean it as applying merely to the footnote. I beg Mr. Lea's pardon for putting it in the wrong place. It was careless; but the notion of the preservative seemed to me such a joke that I could not think very seriously about it, and the thing being put in a footnote still further misled me. But, as to the former point, Mr. Lea only shows his own ignorance by trying to expose mine. I never said that the haloids were not subject to the influence of organic matter—a fact I have been aware of before I ever saw a word written by Mr. Lea. I state it as a fact that albumen, gum, &c., do not exercise the influence Mr. Lea pretends; and whatever may be his theoretical superiority to me I am willing to test my practical knowledge against his in any way. When he goes on to say that "further proof" (if any were needed) "of the marked influence of these agents lies in the fact that gallic acid used with gum gives a totally different emulsion from that produced by gallic acid with coffee," he assumes a degree of imbecility in his readers which would, indeed, leave his knowledge supereminent. Is it possible that Mr. Lea does not know the chemical constitution of decoction of coffee? Has he never allowed a drop of coffee to fall on his steel knife at breakfast and found tannate of iron produced thereby? I reassert that gum added to the preservative for a Bolton emulsion soaked *en masse*, as Mr. Lea proposes, is of no benefit whatever; but I am not such an idiot as to suppose that there is no difference between gum with gallic acid and gallic acid with tannin.

I am willing to discount and return Mr. Lea's compliment by saying that I am convinced he is a much better chemist than experimental photographer, and think I do him a friendly act in advising him to work out his discoveries before publishing them, and to be more careful not to claim as his own what is already known.

In what he says of my "reticence" and publishing nothing he only confirms what I have long conjectured—that he does not read what other people write, even in The British Journal of Photography. If Mr. Lea would be as careful as I am in publishing nothing which I have not thoroughly proved by a long series of experiments he would have spared a great deal of ink and paper; and if he would try as hard to simplify photography as he has to complicate it, or as hard as I have even, we should not find him now recommending modifications of a process which only serve to blind average workers, and keep them in a dance to follow the changes and novelties he proposes with so curious a rapidity. It is very possible that *he* may not be able to repeat my work. I know very few good photographers who care to follow his, and no one amongst my personal acquaintances who has as much respect for it as I have. The value of my formulæ I leave to others to decide; but when Mr. Lea says that I have only "stated in a general way" what I have to say, and not "in any clear or definite manner, such as would permit of verification or use," he leaves me in doubt as to what faculty he is deficient in.

My original objection to Mr. Lea's new process stands confirmed by my own experiments, both as to its needless complication and the minor point of the preservative. I objected, and still object, to Mr. Lea's complicating photography instead of simplifying it—to his prescribing trivial and needless or noxious details of preparation. I have practically proved that most of his complications are such, and, as such, are confusion instead of assistance to experimental workers and those who wish to learn photography. This is the sole reason of my animadversions, which have no personal basis whatever.

He has an exasperating habit of ignoring or rediscovering the observations of other people. This would not move me, as I am indifferent to the credit I may get; but the tone of superiority with which he at once proceeds to envelope such facts as he does recognise in complications of his own, and claiming chief credit therefor, is injurious to photography in proportion to his influence, and I protest against it. I may have been wrong in all my chemical calculations as to his formula; but he can neither remedy his carelessness by showing me to be careless, or obfuscate the common sense of the photographic public by trying to hide his blunders behind mine. Anybody can see mine, I presume.

I hope Mr. Lea will have no needless "pain" in "setting this matter right." He gives me none, and I do not think it hurts your readers. If I think he needs more setting right I shall have no hesitation in trying it, and am equally ready to admit my own wrong.—I am, yours, &c., W. J. Stillman.

*Merstone, Isle of Wight, June* 12, 1875.

[We regret that Mr. Stillman should write in the tone he does of Mr. Lea. The latter gentleman, though compelled to correct Mr. Stillman on various points, did so in no unfriendly spirit; but rather gave expression to his appreciation of Mr. Stillman's labours in connection with emulsion photography. We should be glad to see these recriminatory expressions replaced by a more amicable feeling.—Eds.]

## EXCHANGE COLUMN.

I will exchange the last edition of Towler's *Silver Sunbeam* for Lake Price's *Manual of Photography.* Difference to be adjusted.—Address, J. H. Waite, 2, Louis-street, New Leeds, Leeds.

I will exchange a first-class dark carriage on four wheels, for horse or to be drawn by hand, for a good Ross lens for portraits.—Address, R. Banks, 73a, Market-street, Manchester.

Wanted to exchange, a Ross's No. 3 portrait lens, in perfect order, with diaphragms, for a Dallmeyer's No. 2c or a similar lens. Difference adjustable, if any.—Address, Captain Gubbins, R.A., The Oaks, Leamington.

Ross's landscape lens, whole-plate, twelve-inch focus, with rack and pinion, or landscape lenses, seven and fifteen-inch focus, both fitting same mount, would be exchanged for Ross's landscape lens, nine-inch focus, or Dallmeyer's landscape lens, eight and a-half-inch focus.—Address, S. S. Crewdson, Union-street, Ulverston.

A new polished oak stereoscopic slide, made to be attached to single lens, quarter-plate camera, four bound volumes of the *Photographic Journal,* vols. one to four, also two vols., bound, of Sutton's *Photographic Notes,* vols. first and second, will be given in exchange for useful photographic articles.—Address, E. Lockyer, Photographer, Ringwood, Hants.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

Photographs Registered.—

William Rowe, Leicester.—*Group of Ministers in Conference.*

J. D. Riley, Holywell.—*Four Views of Pantasaph Monastery and Monks.*

A. G. Massey, Armagh.—*Five Views of St. Patrick's Cathedral, Armagh; four Views of St. Patrick's Cathedral, Dundalk; and two Views of Narrow-Water Castle.*

William H. Harrison.—Received. In our next.

J. Carbutt (Philadelphia).—Thanks. The reproduction of the old engraving is really excellent.

S. P. Q. R.—Add a little acid to the silver bath, and also sufficient tincture of iodine to the collodion to impart a deep sherry colour.

Alfonso.—The cause of the want of intensity in the negatives lies either in the silver bath or the collodion; but without further particulars we are unable to indicate in which of them the fault lies.

M. (Birmingham).—The danger likely to arise to the bath from the use of a substratum of albumen is purely imaginary. The writer could not have had an extended experience with it.

R. W. Carter.—The negatives are too feeble. Do not expose quite so long, and continue the development and intensification until the details show well-marked contrasts. Should you still fail, send a negative for inspection.

J. J. Bardwell (Detroit, Michigan, U.S.).—We have been favoured by Mr. Bardwell (per Mr. Goorst) with a few really excellent specimens of landscape and architectural photographs taken by the coffee process. The vigour and fine gradation of these pictures attest the skill of the artist in working this process.

T. M. H.—It will be a fortnight ere we have time to examine into and ascertain the cause of the discrepancy in the conjugate focus as found by you and as determined arithmetically. We can speak very favourably of the enlarging powers of the locket-lens alluded to, and if the microscope object be large the field given will not be quite flat; but for any object up to the size of say a bee it will answer admirably.

Excelsior.—Let the spring in the back of the dark slide be very weak. This will obviate the necessity for placing a glass plate behind the ferrotype plate. No special solutions are necessary, those required in the production of glass positives answering the purpose. We are not acquainted with the triple foreign lens alluded to; but the maker, while he was in business, enjoyed an excellent reputation.

W. Washam.—We are unable to say whether the case mentioned in our last week's issue is a revival of the former one to which you refer. Similar stories of a sensational nature are continually cropping up, principally in the foreign journals, and you are probably correct in your supposition. We believe there is very little difference in action between the sulphocyanides of ammonium and potassium; of the two, the former is, perhaps, the best for fixing purposes.

William Weston (Pendlebury).—We shall be glad to receive an account of your experiments in the direction of an instantaneous formula when fully matured. We agree entirely with your remarks as to the quality of results obtainable by the carbon process as you work it. It would be an improvement in your plan of melting down residues if the mixture of silver and flux were added in small quantities after the crucible had become red hot. This would enable you to use a much smaller crucible, and to reduce the time required for the operation—probably to one-third.

F. J. W.—To obtain the transfers respecting which you inquire: after fixing and washing the negative, place it on a levelling-stand and pour over the film a solution of gelatine—about sixty grains to the ounce of water with two grains of chrome alum being a suitable strength. Allow the plate to remain in a horizontal position until "set," after which it may be stored away until perfectly dry. By cutting round the edges of the dried gelatine film with the point of a sharp penknife the negative may be removed from the glass. If an albumen substratum be employed in the preparation of the plate it will be necessary to apply a solution of caustic potash to the film previous to pouring on the gelatine. In the case of varnished negatives a solution composed of caustic potash one ounce, alcohol one ounce, and water eight ounces, will remove the varnish.

Photographers and Custom-House Officers.—In addition to two letters on this subject in our preceding columns, Mr. Stillman says:—"If Mr. Ross carry prepared plates on the continent he should have *printed* labels in German, Italian, and French on each package, stating that they are sensitised photographic plates and not to be opened in daylight. In entering any country, if practicable, luggage should be entered and examined at the chief towns where the custom house is an important one, as there will always be less trouble than at small frontier ports, where the custom-house officers are more inclined to magnify their importance and do their work with a certain affectation of thoroughness, and much less politeness, than in larger places where there are more strangers entering the country. Thus, Calais is much better than Dieppe, &c. If any difficulty be made about passing the boxes unopened offer to open them in a dark room by candlelight; indeed, show an anxiety rather than reluctance, and take it good-humouredly, for the least indisposition to satisfy the officers, or any of the bluster which some travellers think dignified and effective, is the very thing to make the officers turn everything inside out."

In Type.—Communications from W. H. Warner, D. Winstanley, "Mark Oute," and others.

West Riding of Yorkshire Photographic Society.—The next out-door meeting of this Society will be held on Wednesday next, the 23rd inst., Hebden Bridge being the scene chosen for the excursion. The members will leave Bradford by the 1.10 p.m. train; but those who find it more convenient to start from Halifax may make the necessary arrangements by communicating with Mr. Greaves, Hall End, Halifax.

CONTENTS.

THE BRITISH
# JOURNAL OF PHOTOGRAPHY.

No. 790. Vol. XXII.—JUNE 25, 1875.

## IODIDE *VERSUS* BROMIDE IN EMULSIONS.

Mr. W. J. Stillman's communication in our last week's issue reminds us of a promise made some time ago to give our readers the result of our comparison of Mr. M. Carey Lea's chloriodo-bromide and the ordinary bromide emulsions hitherto in vogue. In addition to this we have applied Mr. Lea's principle of treating the partially-dried pellicle with an organifier to a bromide emulsion both with and without excess of silver nitrate.

As a standard of the old style of washed emulsion we prepared a dried pellicle according to the originally-published plan, subjecting the emulsion during a portion of the time required for sensitising to the action of excess of nitrate, which latter was neutralised previous to pouring out and washing. This was re-emulsified, twenty grains of the dried pellicle (representing as nearly as possible six grains of pyroxyline and fourteen of silver bromide) being used in each ounce of solvents, no addition of organic matter being made.

A quantity of collodion was made according to Mr. Lea's formula, and a further quantity of plain bromised collodion, containing in each ounce sufficient bromide, as nearly as we could calculate, to combine with the same quantity of silver as Mr. Lea's. This was done on the 26th April, and the collodion put away to ripen for a little over month.

The pyroxyline used was one of the finest commercial samples obtainable, being the one we have employed with the greatest success for emulsion work. To vary the experiment we also used a sample of cotton which we had on hand, and which can be made to give very excellent results with care, but which is very uncertain and arbitrary in its behaviour under certain circumstances.

After allowing the collodion to ripen, portions of each were sensitised—first, with thirty grains of silver per ounce; and, second, with twenty-one grains per ounce. In the latter case the emulsion was carefully tested and regulated so as to contain, when poured out, a slight excess of bromide. We thus had—

1. Chloriodo-bromide emulsion with excess of silver.
2. " " " bromide.
3. Bromide " " silver.
4. " " " bromide.

These were also duplicated with the inferior pyroxyline. We found much less difficulty in emulsifying the iodide than we had previously done, owing, doubtless, to the two facts, as noticed by Mr. Lea and Mr. H. Cooper, that the collodion had acquired age, and that we made use of larger bottles in proportion to the bulk of emulsion than had previously been the case. The difference caused by this latter apparently unimportant matter is really remarkable. In sensitising the chloriodo-bromide collodion prepared from the inferior sample of cotton we managed to throw down the whole of the silver salts, and no amount of shaking appeared to produce any effect. The quantity we were operating upon (five ounces) was contained in an eight-ounce bottle. It was poured off into a forty-ounce bottle, and, as if by magic, one or two shakes produced a perfect emulsion. With the other sample of cotton we found no greater difficulty in emulsifying the iodide than is usual with bromide alone.

After allowing the emulsions to rest for twelve hours they were poured out, and, when set, were treated with the organifier, each batch being previously subdivided into four portions, which received different treatment. Three preservatives were employed, viz., plain tannin; tannin, gallic acid, and grape sugar; and coffee and gallic acid. One portion of the pellicle was washed without previous organifying.

The dried pellicle prepared with excess of silver is always of a very dark colour, varying with different organifiers from a clear coffee colour to a dark slate. This is the case whatever quantity of acid be employed in the organifier, and even if the washing water be acidified the first three or four times it is changed. The pellicle will, in the latter case, retain its normal colour until partially desiccated; but if no acid be used in the washing water it discolours during the process of washing. This, however, does not appear to affect the working, or to any great extent the colour, of the finished emulsion, though what effect it may exercise on the keeping qualities we are not prepared to say.

It appears to us, however, that the action of the organifier upon the moist pellicle is not so complete as Mr. Lea has stated; for the discolouration seems to be caused by unconverted silver contained in the body of the prepared mass, which, under the action of the washing, makes its way to the surface and is reduced by the remains of the preservative clinging to the outer portions of the pellicle or held in solution by the water. In support of this idea it is noticeable that the discolouration is entirely confined to the surface; for, if a piece of the pellicle be broken after drying, the fractured parts are found to be of the normal colour throughout the whole thickness.

The short time allowed by Mr. Lea—say fifteen minutes—during which the organifier is allowed to act upon the pellicle, precludes, we think, the possibility of complete action taking place, unless, indeed, the thickness be very small. We have found that it requires several changes of even *hot* water to remove the "greasiness" from the surface of the pellicle, showing that the last traces of the solvents, and, therefore, it may be supposed, other soluble matters, are very difficult of removal.

In our own experiments we have invariably allowed the action of the organifier to continue for three or four hours, and have acidified the various changes of washing water until the greasiness has disappeared, then going on with pure water until no traces of acid are to be detected. Even under these circumstances the dried pellicle becomes discoloured. We have noticed, however, in working with an excess of soluble bromide, that isolated portions of the dried product acquire, under heat, a dark colour—a result we have always attributed to the retention in such parts of undissolved silver nitrate, which, in the absence of restraining acid, produces the discolouration of which we have spoken.

In testing the numerous varieties of emulsions to which we found our experiments to extend it was almost impossible to make the trials under identically similar conditions; that is to say, we have not thought it worth while to expose *thirty-two* different plates in rapid succession with any hope of arriving at equality in exposure. We have, therefore, been obliged to trust in a great measure to collateral trials, or, in other words, to compare one series of plates with another, and then to pit the better or the worse of the two, as might be more convenient, against another. We shall, therefore,

merely sum up the general results of our experiments, for to tabulate the individual results would but occupy space and bewilder our readers.

The normal washed emulsion we found to be less sensitive, though not to a very great extent, than those prepared on Mr. Lea's principle, and perhaps less easily intensified. The chloriodo-bromide plates with excess of silver were a little more sensitive than, but not so easily intensified as, the same plates with free bromide. The bromide plates with free silver, and treated according to Mr. Lea's method, were both more sensitive and *more easily intensified* than the same plates with excess of bromide.

The chloriodo-bromide as compared with plain bromide, silver in excess in both cases, produced with equal exposures only about the same *quantity* of detail; but in the former case the detail came up with greater ease to printing density. It thus appears to us that the introduction of iodide confers rapidity, inasmuch as it produces detail in an available form with a shorter exposure.

With the bromide in excess the plain bromide plates showed a decided advantage as regards rapidity, the intensification in either case being effected with equal facility.

## A NEW FORM OF ACTINOMETER.

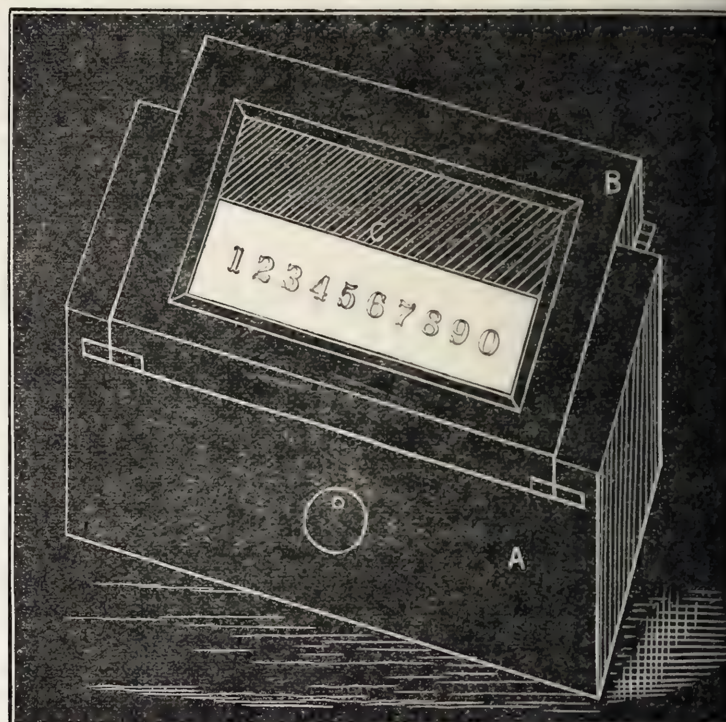
In order to secure the fullest attention of our readers to the following description of an important instrument it is sufficient merely to state that for the actinometer now to be described the photographic world is indebted to Mr. H. J. Burton, whose name is so well known in connection with the great autotype printing establishment at Ealing Dean. Most of our readers are aware that a valuable paper on actinometers, read a few years ago by Mr. J. R. Johnson, at a meeting of the London Photographic Society, owed its inception to Mr. Burton; and equally so are most of them cognisant of the circumstance that this gentleman has been connected with the operative department of the above-named establishment since its formation —a fact which imparts exceptional value to any suggestion for facilitating carbon printing emanating from so practical an authority, more especially when the suggestion has assumed the definite form of a substantial piece of apparatus constructed after, and being the result of, much care and thought.

Like an actinometer introduced by Mr. J. A. Spencer, which we described, with a diagram, at page 576 in our volume for 1870, Mr. Burton's invention is based upon the well-known resistance offered to the transmission of light by a numerically-progressive series of coloured media, the opacity of which increases in a definite ratio with each increase in the order of the numerals; but with this single point of resemblance all similarity between the two instruments ceases.

By the aid of the accompanying diagram we shall describe its construction and mode of action. A represents a small mahogany box somewhat over four inches in length, the other dimensions being in proportion. It has a lid, B, which, as will be seen, is a little deeper from front to back than the box, and is capable of sliding backwards and forwards within a limited range, which is determined by two catches—the first of which, as seen in the diagram, represents the sliding lid when pushed as far back as it will go. This cover is glazed, as seen at C, but one half of this glass—that represented by the shading—is of a deep orange colour, the half towards the front being clear glass, on which are printed the numerals up to 10. The first of these figures is so feebly printed upon the glass as to be little more than barely visible, the second is more dense, and so on up to the last, which, by contrast with the first, would appear, as it were, entirely opaque, although on minute examination it will be found not to be so. On a convenient portion of each figure is impressed a solid but minute black dot, to the action of which we shall presently allude.

But we must now describe the internal construction of the actinometer. It contains a small roll of durable sensitive paper so made as to retain its purity for months when not exposed. This band may be drawn forward over a flat and firm cushion inside, and, by means of two springs, be made to press firmly against the numbered half of the glass cover.

On exposure to light for even a few seconds the paper darkens sensibly; but the precise degree to which this darkening influence extends cannot be perceived by looking upon the surface. In order to ascertain the intensity of the luminous action the cover of the actinometer is slided forward, by which the orange glass is made to cover the sensitive paper that was exposed, and upon which may now be seen the whole of the figures, which are white upon a ground more or less darkened according to the length of time it was




exposed. When we say "white" we understand, of course, that it is so subject to the yellow tone imparted by being seen through a coloured medium. But something more than the figures will be seen. We have said that there is a nearly opaque dot upon each figure, and that dot will be seen in the print upon each numeral precisely in relation to the exposure given. With an exposure of a few seconds the dot on figure 1 will be plainly visible, a still longer exposure shows it on figure 2, and so on up the scale, each figure in the ascent being more opaque than the previous one and resisting longer the transmission of the light.

But the capability of registration is not limited to the "resolving" of the indicating dot up to the last figure of the scale; for as the exposure proceeds, and brings into view the dots on the higher numerals, it is all the time penetrating through the lower ones, and merging each *figure* progressively into the background. Hence by this secondary registration ther ange of the actinometer is greatly extended.

We have exposed many pieces of paper during various periods of time, and find that the indications can be read off with a singular degree of facility through the orange glass, which permits the slightest change to be perceived. The paper, as we have said, retains its purity for a long period when not exposed to light. It is prepared in a very simple manner. A bath is prepared of twenty-five grains each of citric acid and nitrate of silver, and upon this bath ordinary albumenised paper is sensitised.

Mr. Burton is to be congratulated upon having introduced such an excellent actinometer, which renders photometry, especially as applied to carbon printing, extremely easy and very certain. The method of registration by "tints," hitherto used, seems to us to be objectionable on account of the difficulty or, at least, uncertainty of ascertaining the precise period at which the "tint" is obtained, added to which is the fact that many are unable to appreciate slight differences in tints; but with this new actinometer a person who is altogether "colour blind" can make actinometric observations with quite as much accuracy as one possessing the most educated and appreciative eye for colours.

We can deduce from the principle of this instrument that which will enable us to possess actinometers of a pocket size suitable to determine the exact time to expose a plate in the camera to a landscape; but, as this application is too extensive, as well as too important, to be treated in the present article and without careful experiments, it must form a subject for consideration at a future period.

## ON THE VARIED RESULTS OF SOME EXPERIMENTALISTS.

"The glorious uncertainty of the law" has long been considered proverbial, and we are afraid that a diligent student of photographic literature will be inclined to say that photography is very much in the same position, as there is hardly a week passes without our having to record the totally different results arrived at by various operators in performing the same experiments apparently by the same means. There are, no doubt, many departments of photographic manipulation in which a considerable degree of uncertainty and diversity of opinion may fairly be expected; that, however, to which we at present allude does not come under that category, but belongs rather to the comparative sensitiveness of various processes or modifications of some particular process, or to the reactions and interchanges which take place between the elements constituting the *matériel* with which our operations are carried on, and which are, or should be, easily ascertained and thoroughly understood.

The cause of the varied results arrived at by different experimentalists does not then, we feel assured, lie in any uncertainty in the methods by which such results are produced; and we are equally certain that it cannot be accounted for, in most cases at least, by any want of honesty or ability in the men themselves. Neither do we think that it can be caused by any difference in the methods of manipulation, as all trustworthy experimentalists know that, especially in the more delicate operations connected with photography, very slight deviations from a prescribed formula seriously interfere with the promised result, and, therefore, in repeating an experiment are particularly careful to follow with scientific precision the prescribed path. The elimination, then, of these three improbable causes of the diversity complained of would, to a certain extent, seem to restrict us to the only other probable explanation that, so far as we can at present see, has any bearing on the subject; we mean the possibility of a difference to any considerable extent in the quality of the materials operated on, or in the proportion of water of crystallisation in the case of numerous salts, which we know from experience to vary much.

In the practice of photography with the bath, where the silver salt is largely in excess of the haloids, very exact measurement or weighing is not absolutely required; but in the various emulsion processes, when the highest degree of sensitiveness is desired, the combining proportions must be carefully studied and the quantities of each article adjusted with the greatest care, as an exceedingly slight departure from the proper number of molecules of any one substance is, in some cases, a certain source of failure. This necessity for exactness has occasionally been urged as an objection to the emulsion processes; but, in reality, the objection is quite unfounded, as by a very small amount of training an operator will find it quite as easy to be precise as to work by the "rule of thumb."

For exact work, however, we require to know the precise constitution of our chemicals, especially where the water of crystallisation varies; and where the salts are very deliquescent this is frequently no simple matter. Take cupric chloride as an example; and we select it because, after many experiments, we are in a position to say that, as used by Mr. M. Carey Lea, it is of great value in emulsion work. Out of half-a-dozen samples, procured from as many different sources, we did not find, on examination, any two alike, either in the quantity of water present or in the amount of free acid which some of them contained. This difficulty—and it is one that applies equally to many other salts—is easily got over by a plan we have long adopted in our own practice, and by which we can always be certain that we get exactly what we require. Dissolve seventy-nine grains of the black oxide of copper or cupric oxide ($Cu\,O$) in sufficient hydrochloric acid. When the solution is complete the free acid is driven off by gentle heat, the resulting product being cupric chloride ($Cu\,Cl_2$) and a more or less indefinite quantity of water. The seventy-nine grains of cupric oxide contained 63·4 grains of copper, and as it has taken two atoms of chlorine, or twice 35·5 grains, the cupric chloride actually present is exactly 134·4 grains. This is next dissolved in an ounce of alcohol and poured into a filter. When it has all passed through, the filter is washed with alcohol till the filtrate is exactly made up to six hundred and seventy minims—eleven drachms and ten minims. The solution will keep for any length of time, and, each five minims containing exactly one grain of pure cupric chloride, the precise quantity required can be measured with the utmost simplicity. This method of operation may be applied to a very large number of salts; and, in addition to its ensuring the greatest possible accuracy in proportions, it much facilitates work, especially if each bottle be supplied with a simple dropping-tube, accurately graduated in spaces of five minims. It will be noticed that we have employed the new style of notation in this case; while in an article at page 254 we use the old notation, as had previously been done by Mr. Lea and Mr. Stillman.

Another curious example of dissimilarity in results obtained by different experimentalists is in the preparation, or attempted preparation, of the albumen preservative so strongly recommended by our able correspondent, Mr. M. Carey Lea. At the time when it was first published attention was called in our columns to the fact that the albumen was decomposed by the addition of the tannin. Mr. Lea replied that if the substances were mixed in a certain order, different from that in which the formula was published, the decomposition would not take place, and he has since repeatedly recommended it, and asserted that he did not experience the action of which other experimentalists complained. Mr. Stillman, on the other hand, in spite of every care in following the directions given, has been quite unable to succeed in the preparation of the solution. Knowing, as we do, that Mr. Lea is one of the most careful and conscientious experimentalists in this department of photography, we have been anxious to ascertain, if possible, the cause of the discrepancy, and with that object in view have made a large number of experiments with the various articles included in the formula; but in no case have we succeeded in getting a bright, or nearly bright, solution when tannin and albumen were brought together; nor did the order in which they were mixed appear to have the slightest effect on the result, which was always the coagulation of the albumen by the tannin. Eggs, gum, gallic acid, and tannin must be pretty much the same in America as here, although, as regards the latter, Mr. Lea speaks of it as always giving an opalescent solution. That some samples of it do we are aware; but we certainly have no difficulty in getting tannin that is as freely soluble as sugar, and that yields a perfectly bright solution. Tannin, however, as we showed at page 264 of our last volume, is a somewhat changeable body, having a tendency to pass into gallic acid and glucose; thus—

$$\underset{\text{Tannic acid,}}{C_{27}\,H_{22}\,O_{17}} + \underset{\text{Water,}}{4H_2\,O} = \underset{\text{Gallic acid,}}{3C_7\,H_6\,O_5} + \underset{\text{Glucose,}}{C_6\,H_2\,O_6}$$

shows that a molecule of tannin may, by taking up four molecules of water, be converted into three molecules of gallic acid and one of glucose. We wish just to throw out a hint that, as Mr. Lea recently stated that he kept his tannin in solution for some months, it may be possible that some such change has taken place in its composition. As gallic acid does not decompose albumen this may turn out to be the true explanation of the otherwise unaccountable difference in the results obtained by Mr. Lea and dry-plate workers on this side of the Atlantic.

We have much pleasure in calling the attention of our readers to the very lucid description given by Mr. Warnerke, in another column, of his method of working out of doors without glass plates. When we wrote upon this subject last week we were unaware that similar experiments to our own had been in progress for years, and had no idea that those experiments had been crowned with such success as we now know to be the case. The subject is one of such

great moment, and the influence it must have upon landscape photography is so widespread, that we think we shall only be re-echoing the opinions of all dry-plate workers in saying that we look upon Mr. Warnerke's method as one of the most important advances made for some time in this branch of our art-science. The recent introduction of washed emulsions, both of collodion and gelatine, have greatly assisted in the attainment of the desired object; but Mr. Warnerke has most ably surmounted many minor difficulties of detail which have hitherto stood in the way of success. The addition of paraffine to the first layer of collodion for the purpose of causing it to leave the paper with ease is a feature which we owe undoubtedly to Mr. Warnerke, while the ingenious dark slide described and figured by him, and more especially the arrangement for regulating the position of the successive portions of the prepared paper, is another valuable evolution of the same fertile brain. It is quite needless on our part to repeat what we said last week upon the advantages to be anticipated from the use of a pellicular support in preference to glass; it only now remains for some commercial house to take up the manufacture of the prepared paper support in order to place Mr. Warnerke's method in the hands of all photographers. Though within the power of any intelligent amateur, the preparation of this support would be better carried out, and with more uniform results, on a large scale; and we only hope that some enterprising firm will ere long take up the matter.

## SOME REMARKS ON THE CHLORIODO-BROMIDE PROCESS.

Sensitiveness.—Most of the experiments so far made upon this process have laboured under the disadvantages incident to a too-freshly-made collodion. Nevertheless, although the full degree of sensitiveness of which the emulsion is capable has scarcely been obtained, yet the published results confirm with positiveness my statement that the addition of silver iodide not only enables us to get rid of backing, but also increases the sensitiveness of the plate. This will soon be generally admitted as a demonstrated fact. It was well known years ago that, in the case of the daguerreotype, mixtures of silver iodide and silver bromide were far more sensitive than was either of these haloids separately; in fact, the whole success of the daguerreotype depended on this fact. Last winter I satisfied myself that the same was true with sensitised paper, and that bromo-iodised paper was more sensitive than either simply-iodised or simply-bromised paper. Putting this fact together with the one just previously referred to, I felt convinced that the same must be true with sensitised collodion; and, although my first results were unfavourable, yet I soon found that when the relative proportions were properly graduated the increased sensitiveness was very marked. The same result will be found by all who experiment with a good collodion, properly aged. I do not think I venture too much in saying that a few months hence *no* emulsions will be made without silver iodide. The advantage is too great not to conquer any degree of prejudice.

Another point of no small importance to be borne in mind is that no washed emulsion is in really good order till something like a week after the final emulsification. It is very curious, but certainly true, that in some way the collodion reacts upon the silver haloids, insoluble as they are, and modifies their condition. The emulsion becomes denser both as respects viscidity and as respects opacity of the film, and there is also a distinct gain in sensitiveness. I first discovered the fact four or five years ago when experimenting with emulsions made by precipitating silver bromide from solution of silver nitrate in water, washing with alcohol, and shaking up with plain collodion. The change in viscidity and density which took place by standing was most remarkable, and these properties, also sensitiveness, continued to increase for several days. The same is true in the case of the re-emulsification of the washed pellicle.

I have no doubt that this characteristic interfered with the performance of the plates described by the Editors early last month, inasmuch as their emulsion was used the day after mixing. The results, though favourable, were less so than if the collodion had been older and the final emulsion not so newly mixed. With collodion a month old, and the final emulsion mixed for a week, I have obtained plates which have seemed to me as sensitive as wet. The comparison is, of course, somewhat indefinite, because wet plates vary very much.

*Alleged Complication of Formulæ.*—Some writers are disposed to be unreasonable on this subject, and to affirm that what is best must also be simplest. This is not the case in any branch of science or art. The labour that is really lost is that which results in failure or in half success. Care that is taken to obtain thoroughly good results and to secure certainty always repays itself. This is even true when the work has to be repeated on each plate; that which answers once for all for many plates is a small matter, and when it takes the shape of two minutes' attention to add an additional ingredient in the preparation of material for perhaps a hundred plates it would be preposterous to object, if any measure of additional security of good results be obtained thereby.

Suppose that a collection of fifty dry plates is taken on a distant excursion, each plate exposed on a scene carefully chosen, and then carefully developed and worked over till the best possible result is obtained. These plates will have cost before they are ready to print, first and last, *at least* an hour each. Now the use of an additional ingredient in the collodion or in the preservative will have required certainly not over two minutes (supposing it to be regularly employed and kept at hand in quantity). If the use of this ingredient give any additional security of success or any additional fineness of image, how absurd it would be to jeopardise the result of fifty hours' work for two additional minutes!

Sometimes, moreover, the addition of an ingredient may effect an actual saving of manual labour. The use of silver iodide in an emulsion undoubtedly requires the weighing out of some ammonium iodide, and its introduction into the collodion. But the collodion may serve for a hundred plates, and the labour saved in backing and washing off for each separate plate is greater than that involved in the addition of ammonium iodide for the whole hundred. Here is a "complication" which saves just a hundred fold the labour it involves. Besides, the backing may spread dust through the plates, or it may turn mouldy, and diminish their sensitiveness. Silver iodide can do neither. Again: it is a "complication" to use two bromides instead of one only. But experience shows that ammonium bromide has two faults—that of very difficult solution in high alcohol, and that of rapidly acting upon the pyroxyline. On the other hand, cadmium bromide used alone involves a very long delay before the collodion passes into a proper condition. Properly considered all these "complications" are labour-saving—not labour-wasting—in their character.

The same may be said of the preservative. Experience has shown that different substances used for this function have very different qualities. Albumen gives a peculiar richness of effect, exactly the opposite of that poverty in varied tones which is characteristic of poor dry-plate work. Gum gives great sensitiveness; gallic acid and tannin both give brilliancy—the latter more than the former, but at greater cost of sensitiveness. Mr. R. Manners Gordon had two special favourites—albumen plates and gum-gallic plates. Now, for the washed emulsion process a gum-gallic preservative gives high sensitiveness but wretched images. If its action be qualified by the use of albumen the results are excellent. In my own practice I always add a little tannin, because in my hands it gives better results. Always using it, I have *never* any difficulty about the precipitation sometimes complained of. And I may here say, in passing, that I think some have confounded opalescence with precipitation. The mixture is often very opalescent, but, if properly mixed, is always as thin as water, and filters through paper or closely-packed sponge, coming through unchanged in appearance. Twelve ounces, when filtered, will scarcely leave a grain of residue on the filter. The opalescence in no way injures its good qualities. But I have many times said that those who did not like the addition of tannin would find the preservative work nearly as well without it—perhaps with some pyroxylines better. In this way the formula becomes of unobjectionable simplicity.

In chemical manipulations when any investigator finds that a process can be improved by the addition of a new ingredient, or even of several, and publishes it, he is thanked for his information, and anyone who should object on the score of complication would find no listeners. Those, however, who are decidedly of opinion that the preservative must be of a very simple character will find that excellent plates may be made with gallic acid and coffee, as I mentioned in my first description of the process. Those who have not a sufficiently intense collodion will probably get better results with this than with a less intense preservative; or the beer and albumen preservative, which is so great a favourite with many, can be used. It is one advantage of this new method that in addition to the improvements belonging to other parts of the process every experimentalist can suit himself as to the preservative, and what does best with one may not do best with another. I have seen excellent results got by a friend with means that did not suit my collodion at all. There

are many substances with which I succeeded years ago with other forms of the emulsion process which would, doubtless, be applicable to this, such as *tincture of stramonium, tincture of aloes, laudanum, decoction of clove heads,* &c. All these, and many others, gave good results when then tried with other processes, and might do well with this. I, however, so much like the effect of albumen that I would not care to adopt any treatment of which it did not form a part.

*Quantity of Silver Nitrate.*—I am mostly in the habit of using twenty grains of silver nitrate, involving an excess of about four grains; but, as I mentioned from the first, excellent results are got with thirty grains. In fact, there seems no reason why any quantity may not be used that can be got into solution. A few years ago, when I first spoke of using as much as twenty-five grains of silver nitrate to the ounce, the most positive assertions were made that it was impossible to get that much into a collodion, and that a collodion was saturated with silver nitrate when sixteen grains were used. Since then I believe I have succeeded in convincing the readers of this Journal that twice that quantity can be used if desired, and just now the tendency seems to be to go to this length.

There is a probability that sensitiveness increases continually with the quantity of silver nitrate used, even if this excess be completely washed out again, as in the case of a washed emulsion. And there seems also to be an advantage in the plan which I have recommended of postponing the addition of the solution of the chloride until some time after the silver nitrate has acted on the bromide and iodide, thus leaving them temporarily in the presence of a larger excess of silver nitrate than if the chloride had been added beforehand.

At first I varied between twenty-five grains to thirty grains. Latterly I have had such satisfactory results when using twenty-five grains that I have not cared to use more. At the same time it is probable that equally good results—perhaps in some cases better—can be got with thirty grains. It is highly probable that the choice between the two, or between either and intermediate quantities, will depend upon the pyroxyline—some sorts doing best with more, some with less.

Before leaving the subject of silver nitrate I wish again to refer to the importance of using *fused* nitrate. It certainly gives better results than the crystallised.

Since the foregoing was written, two numbers of the Journal (those of the 14th and the 21st May) have come to hand. I thus find that in three consecutive numbers Mr. Stillman has published letters reflecting with great bitterness upon a process which he had not tried, and upon me who had never shown him the slightest discourtesy. In fact, these letters are written with so complete a disregard of all established rules of criticism and, still more, of all the common courtesies of life that it is difficult to know what notice to take of them. Although the processes lately published by me have been the ostensible subjects of animadversion, it is not difficult to see that they and their merits have been a very secondary matter; the intention has been to prove me wrong at any cost. Misquotations of my words have been made, as well as misstatements of those of others. A great desire has been manifested to make it appear that others have found me to be wrong. Addressing the Editors Mr. Stillman says:—"As both yourselves and Mr. Cooper practically admit more or less inaccuracy in Mr. Lea's formula I do not see that he is much helped." What is to be thought of a statement of this sort, made without a particle of foundation? Neither of the parties named admitted, directly or indirectly, any such inaccuracy. Both, on the contrary, corrected Mr. Stillman's errors so efficiently that he should have hesitated to return to the subject except to express regret at the magnitude of his mistakes. Nothing in this whole discussion surprises me so much as that any writer, in the vague hope of placing in a false position for a few weeks one whom he chooses to consider (for reasons which he alone knows—I certainly do not) his adversary, should be willing to do himself irremediable injury. In these three letters of Mr. Stillman there is not a single objection taken against me but what has been shown to be, not merely a mistake, but a mistake of a sort which it is not allowable to make. And it is certainly very curious, to say the least, that all Mr. Stillman's errors of calculation are *concurrent;* they all tend the same way, namely, to convict me of errors that have no existence outside of Mr. Stillman's imagination.

As the criticisms of the Editors and of Mr. Henry Cooper developed error after error in Mr. Stillman's communications—in argument, in equivalents, and in arithmetic—Mr. Stillman found himself obliged to allege still a fourth description of error, namely, of "transcription." What is to be thought of a self-constituted critic who, in endeavouring to fix imaginary errors on another, himself commits errors so multiplied that they admit of classification under so many different heads?

This mistake of "transcription" which Mr. Stillman alleges he made consisted in the substitution of the number "4·336" for 2·336. It has not, however, occurred to Mr. Stillman to explain how, notwithstanding this alleged slip of the pen in copying, the column adds up correctly, which it would scarcely do had the error been one of copying. Moreover, a simple inspection will show that this error constituted an essential part of Mr. Stillman's argument. The correction of this one amongst Mr. Stillman's very varied errors is sufficient to turn the scale and defeat his calculation, so that without this particular incorrect statement his letter could not have been written at all! If, therefore, as he alleges, this error took place in transcribing, and his figures were originally correct, how did they lead him to a conclusion which he himself disproved? But the whole affair is a labyrinth into which it would be useless to attempt to penetrate, even if it were worth while to try.

Differences of opinion must occur on all experimental subjects, and intelligent discussion is the proper means of arriving at the truth; but, I am entitled to ask, do Mr. Stillman's three letters of the 7th, 14th, and 21st May contain anything that resembles intelligent discussion, having the evolution of truth for its object? On the contrary, their sole object seems to have been to make me out wrong at any cost, and to prove it by statements and calculations which to call "extravagant" is to let them off easily. But the true value of Mr. Stillman's logic, his chemistry, and his arithmetic has been made sufficiently manifest. To dwell longer on the subject would be to lend it an importance which it does not possess.

To Mr. Cooper I owe thanks for his timely rectification of many of these incredible miscalculations—a correction necessarily preceding my own by several weeks by reason of delays of distance. Mr. Cooper has also fully confirmed two points on which I have strongly insisted—first, the great advantage of age to the collodion; second, the entire facility with which silver iodide emulsifies. In my own work I heat emulsions containing silver iodide precisely like those from which it is absent. I find no difference of treatment necessary in any respect. As to age, a month is the shortest time that I like to give, even when the ripening is assisted by exposure to plenty of sunlight in a warm room. It is a mistake to omit the addition of a little tincture of iodine to the collodion as soon as mixed; the addition tends, I think, to expedite the ripening and also to keep the plates clean. With ripe collodions made from a thoroughly good pyroxyline, and worked with intelligence and care, I think there will be no difficulty in obtaining the result which I claimed, namely, a sensitiveness equal to that of wet collodion.

In his explanation of the reason why drops are preferable to minims Mr. Cooper is perfectly correct. The objection made by Mr. Stillman has been repeatedly made before, but I have never thought it worth answering. Quantities less than ten or fifteen drops can always be measured more satisfactorily by drops than by minims; this is a matter which admits of no doubt whatever. It is certainly true that different liquids have very different-sized drops, which is not in the least to the point, as we have here to do with one and the same liquid. There are also differences in the size of drops depending upon the neck of the vial from which they are let fall; but these differences are, in the present case, wholly unimportant. This sort of objection is not criticism but carping.

The very good remarks of the Editors on the subject of so-called "complications" have reached me since that portion of this communication was written. The illustrations might be indefinitely multiplied. A swing-back is a complication to a camera; so is a second lens to achromatise the first; and then the addition of a second achromatised lens to straighten the lines is a further complication. Why not use an uncorrected view lens for all work? It is a great deal easier to make. The argument is no more absurd than some of those that have been advanced against "complications."

M. Carey Lea.

## MR. W. BROOKS'S PROCESS FOR PRODUCING BRILLIANT PRINTS FROM WEAK NEGATIVES.

Photographers are under a great obligation to Mr. W. Brooks for the thoroughly practical instructions he has freely given in his paper, published in The British Journal of Photography of last week, on a method of obtaining good prints from negatives from which by any of our ordinary processes nothing but poor, flat, feeble results could be produced. He has written with sufficient detail to enable

anyone at once to put the process into practical use, with nothing required in the shape of apparatus or chemicals beyond what is needed everyday in the printing room.

I am justified in writing so confidently from the fact that Mr. Brooks has unknowingly forestalled me in making the process public; for I had, many months ago, conceived the same idea and experimented with it, producing results with which both my printers and myself were highly pleased. I only refrained from making it public till I had an opportunity of trying it for different classes of work and with certain variety of details which I considered might add to its utility.

It will be understood that this article is in no way intended to detract from the merit of Mr. Brooks's publication; for to him belongs all the credit of first making the process public and in a working form. One of its chief beauties is its great simplicity, in which it reminds one of Columbus's egg; anyone can try it, and I venture to predict that everyone who does will at once see its value. I was led to try the plan when the Dernier process was so much discussed, and I believe it very probable that Mr. Brooks's process will be found to contain the whole secret of the matter.

It is quite possible that the results obtained may be improved by the use of the strong bath Mr. Brooks recommended; but, in my own experiments, I used my ordinary bath (forty to fifty grains), and albumenised paper (Rive), and those who wish to make a first trial will obtain enough with their usual bath and paper to make them see the utility of the process. Further: I did not at all tone either the paper negative or the positive used to obtain it. The results more resemble pictures on porcelain than ordinary paper prints, the effect being quite peculiar and very attractive at first sight.

My trials were limited to *carte* negatives; but I foresaw that when used for larger ones still better results would follow. I believe it very probable that it may be found worth while when enlarging negatives to make them thin with the express purpose of being treated according to this method. Some special investigations I have had on hand for some time preclude my engaging in anything else till they are completed; but I strongly advise everyone to try for himself, for I firmly believe that there is very considerable promise for the future in Mr. Brooks's process.

I may name here one or two points I had set down for consideration and trial. The paper negative alone retards the printing most considerably, and where many prints are wanted it might be advisable, under *all* circumstances, to render it translucent. I used wax for the purpose. It is possible that dipping the positive in boiling water, to remove the size, would be the best plan to enable the paper to be easily waxed. Castor oil, which Mr. Brooks recommends, is a non-drying oil, and paper treated with it would be likely to get too readily soiled unless always protected with the extra sheet of glass he recommends.

Mr. Brooks's idea of treating the positive with touches of opaque pigment where special depth is required in the shadows is very excellent. The method that occurred to me was to use the paper negative unwaxed, and, when any special dark tone was needed, to render the paper more translucent by means of some such expedient as wax or oil; probably a combination of the two methods would be the best.

I found, as did Mr. Brooks, to what an extent the process would do away with retouching; and, although, as I have just said, I believe it may be worth while to take negatives with the new treatment specially in view, I cannot too strongly re-echo Mr. Brooks's warning not to permit this new facility to render the operator slovenly and careless in manipulation, trusting to all defects of workmanship on his part being remedied either by the new process or by the aid of the retoucher. G. Watmough Webster, F.C.S.

## A NEW METHOD OF USING PAPER IN PLACE OF GLASS FOR NEGATIVES IN DRY-PLATE PHOTOGRAPHY.

[A communication to the South London Photographic Society.]

All photographers are aware that photography out of the studio, with the systems now employed, presents certain difficulties which make the process of taking a photograph anything but pleasant. Having, in my photographic excursions, experienced all these inconveniencies I adopted from time to time different improvements; and, having now arrived at a very satisfactory solution of that all-important question for every photographer engaged out of the studio, I intend to give a full description of my method of working, and illustrate it by practical demonstration.

I scarcely need discuss the question whether the wet or dry system is to be employed for landscape photography. Owing to the great perfection reached in the preparation of collodion and gelatine emulsions my choice is made, without hesitation, in favour of the dry system.

The first obstruction encountered is the material employed at present as a support to the sensitive film. Glass, notwithstanding the last extremely important discovery of M. de la Bastie, possesses many disadvantages when used in out-of-door photography. 1. It is heavy. 2. It is bulky in itself, and more so from the necessity to leave an empty space between the plates to prevent contact with the sensitive surface; and, again, from the necessity to have some kind of box for storing. 3. It is brittle, and consequently requires extra care in transport. But all the drawbacks to the use of glass are too numerous to enumerate. They are known to every photographer; and I hope that the experiments I have to perform, while showing the superiority of my new system, will render the disadvantages of glass more salient.

My principal improvement upon the old system is the substitution of paper, cloth, or any flexible material for glass, as a support for the sensitive film. In my early experiments (made some five years ago) I applied simply-bromised collodion to paper of fine texture sized with starch. But when it was used without substratum, prolonged development or further intensification occasioned discolouration of the paper by the action of the pyrogallic acid, and it consequently was regarded by myself as unsuccessful. But I cannot omit to mention it on the present occasion, owing to the very important observation made that bromised collodion in contact with the paper is completly more sensitive than the same in contact with glass, gelatine, india-rubber, or dammar varnish. The paper used by me was Steinbach's photographic. My experiments were made a long time before Mr. Bolton published his excellent washed emulsion process, so my collodion was made from—

| | |
|---|---|
| Sulphuric ether | 4 ounces, |
| Alcohol | 4 ,, |
| Solution of bromine 1 dr. in alcohol 1 oz. | 20 minims, |
| Suitable pyroxyline | 40 grains, |
| Nitrate of silver (in hot alcohol) | 60 ,, |
| or equivalent of oxide of silver. | |

Neither preservative nor washing was necessary.

My next step was using a gelatine substratum between the paper and bromised collodion. In that and in the former case, to avoid discolouration, the developer was free from water. After exposure the sensitive surface was flowed with a solution of—

| | |
|---|---|
| Pyrogallic acid | 30 grains. |
| Alcohol | 1 ounce. |

The excess was returned to the bottle for future use, and immediately the following solution was applied:—

| | |
|---|---|
| Alcohol | 1¼ ounce. |
| Solution of bromine 1 dr. in alcohol 1 oz. | 10 minims. |
| Strongest ammonia | 2 drachms. |

The negative, when finished, was put on the glass, immersed in hot water, and the temporary paper support peeled off. Further experiments proved that great simplification and excellence is secured by the following method:—

### Preparation of the Negative Film.

I take a sheet of white enamelled paper, bend all the sides to form a shallow dish, put it on a glass plate of the suitable size, pour in the centre some plain collodion to which a small quantity of paraffine in alcohol has been added, and return the excess, after distribution and usual rocking, to the bottle. This, when dry, will leave the paper very easily; but, to avoid this occurring prematurely, lines are made with a ruling pen or brush and asphalte varnish round the sheet; or, if it is to be cut, each plate is to be marked out with varnish. When this thin coating of collodion is dry a solution of india-rubber in benzine is applied in a similar way. When dry another coating of the following collodion is applied:—

| | |
|---|---|
| Ether | 20 ounces. |
| Alcohol | 40 ,, |
| Castor oil | 1 ounce. |
| Pyroxyline | 1 ,, |

After drying another india-rubber coating, and, lastly, sensitive bromised, chloriodo-bromised, or any other washed collodion emulsion is applied. When gelatine emulsion is preferred the last india-rubber coating is omitted.

I found the film is equally good when, after first coating of the collodion and paraffine, the following solution of gelatine is applied:—

| | |
|---|---|
| Gelatine | 1 ounce. |
| Sugar | 1 drachm. |
| Glycerine | ½ ,, |
| Water | *quant. suff.* |

After it is dry coating with collodion and india-rubber follows, and, lastly, the sensitive emulsion.

In preparing the film I prefer to build it from several thin coatings instead of one of requisite thickness, because in that way I can avoid irregularities in thickness occasioned by the curling of the paper. For the same reason the draining of the solution is made each time from a different corner.

The prepared negative film, with its supporting paper, is cut to the desired size, interleaved with tissue paper for extra security, and preserved from light for use.

EXPOSURE.

For large plates the film is exposed in the usual dark slide behind the glass plate. I choose the glass plate the same thickness as the ground glass in the focussing-frame, and, after reversing the last, I have the sensitive and focussing surfaces to coincide. For small plates, from $6\frac{1}{2} \times 8\frac{1}{2}$ down, I prefer to avoid the use of the glass plate, and attach the paper with the sensitive film to some rigid support. Mounting boards answer the purpose very well; but when even this inconsiderable thickness is objectionable, ferrotype plates are an excellent substitute. Negative films with supporting ferrotype plates are so thin that in my excursions, last summer, I have been able to put twenty of these plates in every dark slide; and having with me a Howard tent attachable to the camera stand, in three dark slides sixty negatives were taken without the necessity of repairing home, or having a plate-box for these sixty plates.

DEVELOPMENT.

For the development I have to detach one corner of the film with a penknife, and, holding it with two fingers, all the film can be easily detached from the supporting enamelled paper.

After this it is attached to a glass plate of the same size by means of a few drops of water. From that moment the development of the negative is proceeded with in the manner familiar to every photographer. In fact, the film is attached so firmly to the glass plate that there is not the slightest difference in the behaviour of that and old glass plates.

After development, fixing, and washing some blotting-paper is applied to remove the last drop of water. This mode of drying—provoking shuddering in the followers of the old glass system—need not be feared with my films. The final drying—especially when gelatine has been used in the formation of the supporting film—must be executed under light pressure, between blotting-paper, in a book or otherwise. If convenient it can be dried on the glass plate and varnished, avoiding varnishes requiring heating of the plate; but there is no necessity for varnishing, except to facilitate retouching.

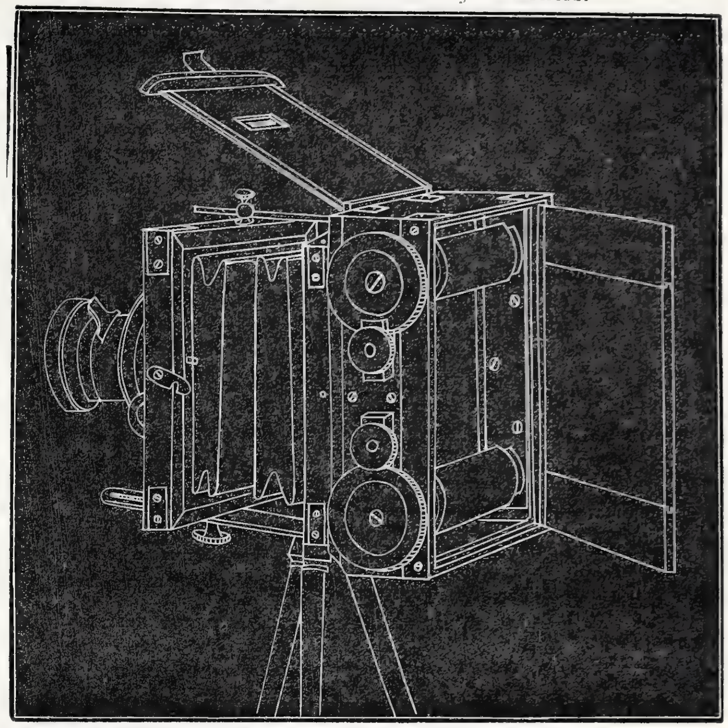
In this stage I have used the process for the last two years with invariable success, and have hundreds of negatives to testify it. But I must confess I am subject to all human imperfections. We are never satisfied with what we possess; and this spring, waiting for longer and brighter summer days, and planning my new excursions, the thought of carrying in my pocket a Howard's tent, and prospect of plunging my head into that tent for changing each plate after the exposure, looked to me an unbearable torture. For consolation I retired to my work room, and, after some time, succeeded in preparing the slide which is intended to remove the last impediment in my way.

DARK SLIDE.

The principal components of the new dark slide (of which a diagram is given in the adjoining column) are two rollers on which the sensitive film, with its supporting paper or without, is wound, and there is room enough for one hundred plates. A darkened glass plate is fixed in the front, in the place corresponding with the focussing surface; this glass plate guides the sensitive film in the progress from one roller to the other, and secures its proper position. Each roller has a metallic head by which it can be put in motion. By means of these heads all the ribbon of sensitive film can be consecutively drawn from one roller, and, after exposure, re-wound on another roller. But to secure perfect flatness there is attached to each head a pressing screw, that arrangement permitting the stretching of the film when in position. Before the sensitive ribbon is attached to the roller it is divided into sections corresponding with the size of the plates by black lines drawn in pencil, or otherwise, and each section is numbered.

In the sliding shutter is a little window secured with orange glass and spring metallic shutter. Through the orange glass I am able to observe the black lines forming the divisions between the plates and corresponding numbers. This permits me to judge of the proper position of each consecutive plate, tells me which plate is to be exposed, and, if any imperfection be observable, which plate to avoid.

The production of negatives in the field with the aid of these improvements is a real enjoyment, because all the hard work is removed, and numerous advantages are gained over the old system. The bulk and weight of plates and apparatus are diminished. Chance of breakage there is none; the chance of abrading the sensitive surface is diminished. I ascribe to the flexibility of the support the greater amount of resistance to rough treatment my film offers.



Blurring is impossible. In its application to the panoramic camera, what can offer facilities similar to the new film? All costly cylindrical plates and special printing-frames are needless; the sensitive film may be made to take any shape in the dark slide, but will be flat in the printing-frame.

For printing in carbon, and for all processes requiring reversed negatives, the film negative is ready without preparation. For printing stereoscopic negatives transposition is easy. For storing negatives no room, no boxes, or shelves are necessary. Film negatives are not destroyed by atmospheric influences.

Lastly: who can, with the glass system, when going to distant lands, dream of taking one thousand plates for his long excursion? But with my film that number, or one still larger, would not increase the weight of the traveller's luggage more than by a few ounces, and by a few inches the space occupied.

When I look to the future the circle of the beneficial effect still widens. The pliability of the sensitive film can alter the optical conditions of our apparatus. Our lenses will be smaller; definition more perfect; distortion, spherical aberration, and other optical imperfections diminished; the aperture increased, and consequently the exposure shortened.

I conclude with another less important improvement. I do not like the black cloth we use to cover the head when focussing. It gives a mysterious appearance to the operator, and increases the curiosity of the passers-by. Very often it conspires with the wind, without any respect for the head-dress of the operator or the stability of the camera. In my apparatus I substitute a looking-glass inclined 45° to the ground glass. The image appears in the right position, is much brighter, and, when shut, the frame containing the mirror offers a protection to the ground glass, taking infinitely less room than the black cloth. LEON WARNERKE.

## A NEW AND SIMPLE METHOD OF RECOVERING SILVER FROM HYPOSULPHITE WASTES.

IN the *Bulletin* for April, 1874, I communicated a short method of recovering silver from hyposulphite of soda wastes, by means of Labarraque's solution (hypochlorite of soda).

I proved that the hyposulphite is changed into sulphate of soda, and that the silver obtained thereby is free from any admixture of sulphur. As the preparation of this solution may be somewhat difficult to operators not skilled in practical chemistry I had tried to find an easier process of regaining silver from hypo., and believe to have, therefore, supplied a want long felt by the photographic fraternity. Here is the process:—To a gallon of hypo. solution add one pound of caustic soda dissolved in a pint of water. Dissolve a pound of grape sugar in a small quantity of hot water and pour it

into the above mixture; then raise the obtained combination to the boiling-point, and you will have an instant precipitation of metallic silver in the form of a black powder, which may be easily washed by decantation, and is perfectly soluble in nitric acid. If any one be not provided with an apparatus to boil so large a quantity he can obtain the same result by allowing the mixture to stand at the common temperature for twenty-four to thirty-six hours.

Here follows the explanation of the chemical changes taking place:—The grape sugar has a tendency to easily undergo oxidation, while the silver salts are readily inclined to give up their oxygen with the production of metallic silver. The presence of the caustic soda increases the action between the grape sugar and the silver salts, and a number of organic acids are produced from the sugar which combine at the same time with the soda.—James Chisholm, in *Photographic Times*.

N.B.—A very short way to reduce the chloride of silver wastes is the following:—Wash them well, dissolve them in the hypo. solution, and treat them with grape sugar, as in the above process.—J. C.

## THE PHOTO-RELIEVO PROCESS.

No. I.

As the photo-relievo process is again attracting the attention of photographers the following notes will probably prove of interest, They consist essentially of memoranda from my note-book of the time, and describe the Woodbury process as it was some years ago. but with more of collected detail than, I think, has yet been seen in print. The photo-relievo process, as it now is, no one probably but Mr. Woodbury can well describe, and I scarcely think he is likely to feel tempted to enlarge thereon.

The following is a list of the operations, apparatus, means, and chemicals required:—

| | Operations. | Apparatus and Means Required. | Chemicals Required. |
|---|---|---|---|
| No. 1. | Preparing hydrated gelatine. | Pan, cup, fork, spoon, strainer, pot, and fire. | Water, gelatine, and albumen. |
| ,, 2. | Bichromatising the same. | Graduated glass, balance, and test glass. | Bichromate of ammonia, hydrated gelatine, Prussian blue, and water. |
| ,, 3. | Preparation of the film. | Glass plate, talc, or collodion, levelling-stand, drying-box, and knife. | Coloured bichromated gelatine solution. |
| ,, 4. | Exposure to light. | Solar apparatus or artificial light, negative, india-rubber bands, filter paper, and pieces of board. | Coloured bichromated gelatine films. |
| ,, 5. | Development of the relief. | Tray for hot water, large camel's-hair brush, glass plates, and cotton or silk thread. | Coloured bichromated gelatine films and water. |
| ,, 6. | Drying the same. | Fire and box. | None. |
| ,, 7. | Production of the intaglio. | Press (preferably hydraulic), metal plates, and surface plates. | None. |
| ,, 8. | Preparation of the ink. | Pan, pot, fire, glass rod, and strainer. | Hydrated gelatine, lampblack, sepia, and crimson lake. |
| ,, 9. | Operation of printing. | Printing-press, water bath, thermometer, small cans or pots, small brushes, lamp, and intaglio. | Prepared ink. |
| ,, 10. | Fixing the picture. | A dish. | Alum and water. |
| ,, 11. | Washing ditto. | Ditto. | Water. |
| ,, 12. | Finishing ditto. | Cards and rolling-press. | None. |

Particulars of Operations.

*The Preparation of the Hydrated Gelatine.—Formula*:—

| | | |
|---|---|---|
| Nelson's opaque gelatine | 6 ounces. |
| Water | 25 ,, |
| Albumen of | 1 egg. |

The gelatine is to be put into a pan and covered with the water, in which it is allowed to soak for a number of hours—preferably about twelve or fourteen. The albumen of the egg is put into a cup with its own volume of water and beaten into a froth. The soaked gelatine is then melted by the application of a gentle heat, and the diluted albumen added thereto. The heat is now gradually increased under the pan, the contents of which is continually, but gently, stirred until it begins to boil. After boiling from two to three minutes the spoon, or stirrer, is withdrawn, the heat removed, and the pan allowed to stand untouched for about ten minutes. The scum, which during this time rises to the surface, is then skimmed off with care, and the comparatively clear fluid beneath is carefully filtered through coarse flannel or fine muslin which has been previously washed in boiling water, the excess of which must have been well pressed out. The resulting filtrate is the hydrated gelatine, which, when cold, is a light-amber-coloured, solid body of about the same consistence as india-rubber, and which, in a cool place, may be kept ready for use for upwards of a week.

Cox's transparent gelatine may also be employed. It has the advantage of not needing to be clarified; but it has also the disadvantage of having less "body," so that more of it must be used. Even then, to my thinking, it is on the whole an inferior substance to Nelson's gelatine. D. Winstanley.

## FOREIGN NOTES AND NEWS.

Herr Remelé's Concluding Remarks on His Photographic Tour in the Lybian Desert.—The Respective Merits of Alcohol and Ether in Collodion.—Dr. Vogel's Collodion.—Another New "Accelerator."—Foreign Rediscoveries.—M. Fleury Hermagis' New Stereoscope.—A Suggestion for the Police.—Death of a Veteran Photographer.

About a couple of months ago there was a short account in these *Notes* of Herr Philip Remelé's photographic tour in the Lybian Desert, and as a few supplementary remarks on the collodion he found suitable, the light, the atmosphere, and similar topics have just come to hand we shall give their substance, as they may be of interest to any one who may wish to compare Herr Remelé's experience in these matters with that of English Eastern travellers.

The winter of 1873-4 was unusually cold in Egypt and in those parts of the Lybian Desert through which our tourists passed. Even in March, when the temperature in ordinary years has already become tropical, they had comparatively few *very* hot days, and to this circumstance Herr Remelé in a great measure attributes the facility with which he succeeded. When the temperature was very high the principal cause of failure was the collodion. Herr Remelé had taken with him a supply of Beyrich's instantaneous collodion, which is alcoholic and watery. Under normal circumstances it worked well, but when the heat was great it dried in unequal patches all over the plate, the upper, thin part of the film often being dry before the collodion was dripped off the lower part. This caused blemishes, and all the plates showed the well-known blue border. This collodion was, however, much improved by the addition of a considerable quantity of ether, which, though it caused the film to dry even more rapidly after being coated, made it also dry more equally. This dilution likewise made the film weak and less sensitive; but a longer exposure overcame that difficulty. Encouraged by the result of this trial, Herr Remelé expresses his determination of using in tropical countries, where the air is dry, an ether collodion free from water and drying quickly.

In the clear, transparent atmosphere of the Lybian Desert the difference in illumination between objects on which the sunlight falls and those in shadow is much more marked than in Germany, and Herr Remelé protests against the harshness of lighting apparent in most of his views being attributed to the hardness of the negative. It is, he says, merely a reproduction of the natural effect of a desert landscape on the eye of the onlooker. As he had unfortunately no photometer he was unable to make any exact observations of the intense strength of the light. In the shade, however, it was not very great, as the length of time required at Dachel to print a few copies testified. The time required to expose a view was similar to that required in Germany in summer; but in respect to the action of the chemicals the great difference between the temperature of day and night had to be considered. On one occasion, from noon till two

o'clock the thermometer stood at + 19° R. in the shade, and at sundown at 3°. It is well known that cold chemicals work slowly, so that he had to regulate the time of exposure not only by the illumination of the landscape but also by the degree of temperature. If the photographic tent stood, as it often did, in the sun, then so intense was the heat in it as to be on an average from 10° to 12° higher than in the open air.

Early in February an inconceivable number of flies made their appearance in the oasis, and proved a great hindrance to the photographer, especially when taking portraits of the natives. These latter are so annoyed by their little tormentors as scarcely to be able to sit still long enough. Even the barber of Dachel, whose power of sitting still was usually extraordinary, moved ten times in succession! so whenever it was possible these dark gentry were requested to come early in the morning before their enemies were astir.

In taking these portraits a certain number of Arabian phrases were required, treating principally of the necessity of sitting still, of the direction of the eyes, and of placing the head in the rest. But these phrases were easily learnt, and besides the Sheik Mohamed Daud, who spoke French fluently, often acted as interpreter. At such places where the flies were numerous the finished plates had to be carefully protected when set up to dry, as a few of these pests alighting upon the picture film would infallibly have ruined it. The water found in the various springs and wells, which was all that was available for mixing with the chemicals, was generally very impure; the well at Farafrah was the only exception, its water being clean and pure. At the oasis of Dachel the water is strongly impregnated with iron and salt. Most of the springs in this oasis are thermal, with a temperature of from 30° to 36° R. After the water from these springs stands for a long time it deposits considerable quantities of iron oxyhydrate in the form of flakes. The iron developer to which this water was added generally acted immediately after it was poured over the exposed plate, but as soon as the image began to appear white curdy flakes formed in the fluid, some of which adhered to the film and could only be removed by thorough rinsing. Sometimes, indeed, they stuck so fast, in spite of all that could be done, that they destroyed the plate. When things had got to this pass there was nothing for it but to clear the rest of the water by the addition of nitrate of silver. After the addition of a small quantity of silver the water was set in the sun for some time and then filtered, after which it might be safely used with the developer. If any deposit should be formed arising from excess of silver then the solution had to be filtered again. This operation was troublesome, but the good results obtained by it repaid the trouble.

In the oasis of Chargeh most of the springs are very salt; but, in the neighbourhood of the temple there, there was a well of remarkably clear, pure water. The waters of the Nile, which are celebrated for their purity—or, as the native Egyptians say, for their sweetness—was usable for every kind of solution, always provided it was filtered beforehand to remove the mud. It had, however, to be drawn direct from the stream. The water taken from the Nile canals and the temples standing by its banks was very impure, being for the most part charged with salt, which it carries off in solution from the salt-impregnated soil in which it stagnates or through which it slowly oozes.

The article from which the above has been taken having been read before the Berlin Photographic Society, Herr Quidde expressed his surprise that Herr Remelé had obtained better results almost in the tropics with a quick-drying, etherised collodion than with an alcoholic one, when one would naturally have expected the opposite to be the case. He called attention to this circumstance as a very important hint to those who required to work where the temperature was high.

Herr Braun said that he was often so placed. In March he had to set up his dark room at Charlottenburg so close to a kiln that the average temperature in it was about 30° R. There he had used an alcoholic collodion kept continually in cold water, but he would try the ether.

Dr. Zenker held that the transport of collodion which contained much ether must be very difficult in the tropics, owing to the very volatile nature of that preparation; and that in any case a quantity of ether must be added before each time of working in order to make up for what had evaporated in the interval. On the occasion of the expedition to Aden in 1868, when Dr. Vogel went to photograph the eclipse of the sun, he used alcoholic collodion.

Herr Linder said that Aden had a very exceptional climate, and that very likely the rules which applied to it would not apply to the climate of the Lybian Desert.

The President feared that when a collodion which dried so rapidly was used all sorts of blemishes—such as fogging, cross-hatching, and the so-called "horny" tissue—would be apt to make their appearance.

Herr Fechner had remarked for some time back that the commercial collodion obtainable nowadays was almost always slower of drying than it used to be, and he concluded from what had passed that it was prepared with alcohol.

Herr Bergemann, as a manufacturer, denied that. He said that equal parts of ether and alcohol were taken, and four per cent. of water was added to the alcohol, which very likely accounted for the slower drying. In the so-called "instantaneous" collodion the addition of water was still greater, on account of the great quantity of iodide of potassium.

None of the members of the Society seemed to know whether Dr. Vogel meant to use the wet or dry process this time, nor whether he would use the same collodion as upon the former occasion; but from another source we learn that he has taken with him a number of *dry* bromised silver plates prepared in the following manner:—*Preliminary coating:* One part caoutchouc in 1,000 parts of benzine. *Collodion:* One part of bromide of cadmium in fifteen parts of alcohol, diluted with three times its volume of plain collodion containing two per cent. of cotton. *Silver solution:* Ten grammes of silver, eighty grammes of water, and one drop of nitric acid. Plates so prepared to be developed with Dr. Vogel's own alcoholic ammonia developer.

In arguing, as some of the members of the Society did, that Herr Remelé should have used the collodion Dr. Vogel found suitable at Aden, it seems to us that they not only did not consider the possible difference in climate between Aden and the Desert, but that they quite forgot the very different objects these travellers had in view. That is to say, that Herr Remelé went to take ordinary landscape views, and required plates that would bring out colours in the proportionate tones to which we are accustomed in ordinary photographs; while Dr. Vogel, in studying the variation of the sun's spectrum, sometimes requires a plate which shall be most sensitive to rays of one colour and sometimes to another, so that it would be reasonable to suppose that a collodion which was the most suitable for spectral photography might be extremely unsuitable for landscapes.

In the *Moniteur de la Photographie* M. Alexandre, of Marseilles, gives a formula for an "accelerator" to be used with the iron developer, and which is said to give almost the same rapidity as formic acid. Mix together in a glass flask—

| | | |
|---|---|---|
| Sulphuric acid | 6 | parts. |
| Water | 4 | „ |
| Methylic alcohol | 4 | „ |
| Peroxide of manganese (in powder) | 6 | „ |

Distil at a gentle heat. M. Alexandre uses for the refrigeratory portion of the apparatus a leaden pipe bent in the shape of a worm, and placed in an ordinary flower pot, the tube passing through a cork placed in the hole in the bottom of the pot, which is filled with cold water. The distilled liquid is said to bear the same relation to methylic alcohol as aldehyde to the alcohol of wine. Five parts of this distillate are to be added to 100 parts of iron solution, the account not saying whether in place of, or in addition to, acetic acid. If the former, it appears to us the term "accelerator" is a misnomer. Aldehyde has been long known in England to possess similar properties, and the nameless product of M. Alexandre is little more than a "rediscovery."

Speaking of rediscoveries, Herr Klinger has recently published in the *Photographische Archiv* a method of strengthening feeble negatives which we remember to have used at least ten years ago, and which was in all probablility not new then, viz., the exposure of the unfixed negative to strong sunshine. It is remarkable how, almost weekly, these rediscoveries crop up in the foreign journals—rediscoveries of little matters which are among the first things learnt by English tyros. Hence it is, doubtless, that most of the advances made in photography during the last five-and-twenty years are claimed by foreigners.

At the last meeting of the Photographic Society of France M. Fleury Hermagis exhibited a new stereoscope of very ingenious construction. Between the eyepieces and the picture are placed two *square* achromatic lenses the full size of the picture to be viewed. Much greater magnifying power is thus obtained without distortion, the objects appearing to be of their natural size.

While on the subject of stereoscopes, we may add that M. Lacan makes a suggestion to the police authorities to the effect that in photographing criminals a more truthful and tell-tale likeness would be obtained if stereoscopic instead of single pictures were taken. We wonder how the detectives would like to carry a stereoscope about for the purpose of duly comparing the photographs of persons "wanted" with any suspicious characters they might chance to meet!

The French journals announce the death of M. Edmond Bacot, of Caen, one of the earliest photographers, and a *collaborateur* of Daguerre. M. Bacot was the first to produce rapid pictures on albumen.

## Correspondence.

### LENS-HOOD AND FLAP-SHUTTER.—KENNETT'S PELLICLE.

*To the* Editors.

Gentlemen,—Now that emulsion dry processes are become available for such rapid work as could be done formerly with wet plates only, two additions to camera-fittings—namely, the hood for certain lenses and the flap-shutter for the management of short exposures and equalising exposure of sky and foreground—have become almost indispensable to the amateur. For his benefit I will describe a contrivance I have lately constructed, in which the two purposes are combined. The apparatus is simple, light, compact, and can be effectively made of such materials as any amateur not possessing workshop, lathe, or metal tools may work in.

It consists of a square cardboard box, conical form back to front, covered with black calico, velvet, bookbinders' or American cloth, the small end to go over the lens, and to be attached to the sliding-front of the camera. The upper side of the box has a portion cut away—as far back as the front of the lens-mounting. Into this aperture is fitted a flap of cardboard covered with velvet, long enough, when down, to cover the lens. A piece of wire rather longer than the aperture in the upper side of the box, and attached to the upper edge of the flap, forms a hinge, on which it works. The flap should also have a bit of sheet-metal, or the wire may be bent in the middle into a loop, projecting half-an-inch from the upper edge of it, by pressing which the shutter is raised. A bit of weak "elastic" attached to the shutter will ensure its rapid closure on being released.

The cardboard of the sides of the box should be cut half-through in the middle. horizontally, before covering; the sides will then fall in and lie flat on the bottom, so that when the flap is raised parallel with the top the whole thing occupies but the thickness of the four pieces of cardboard. For long exposures the flap shutter may be kept up by a turn-button.

The hood may be attached to the camera front in various ways. The one I have adopted consists of two slips of thin brass the length of one side of the base of the hood, turned to more than a right angle—these screwed on the rising-front, above and below the lens-flange, serve to keep the hood in place when it is sprung-on over them; thus the hood may be so put on that the shutter can be used from above, and also from the right and the left, as the subject may require.

Lest a verbal description should not convey a sufficiently clear idea of the article, I enclose a rough model from which a drawing can be made if required. It may, if you please, lie at your office for the inspection of those interested in it.

I am pleased to tell you that the Kennett pellicle is working most satisfactorily with me. The difficulties of the process are rapidly vanishing now that more workers have taken it in hand and are following it out in earnest. Its rapidity and sensitiveness to weak light continues to astonish me.—I am, yours, &c., G. S. Penny.

*Cheltenham, June* 22, 1875.

[Those of our readers who may be interested in this ingenious piece of apparatus may inspect it by calling at our editorial office, where a model now lies. To show its extreme portability, we may state that the model came to us through the post in an ordinary envelope.—Eds.]

### M. LAMBERT'S IMPROVEMENTS.

*To the* Editors.

Gentlemen,—The attention of photographers will naturally be aroused by M. Lambert's advertisements, as well as by the lucid description given by you last week of the demonstration that you witnessed. As my son, Mr. Alfred Hughes, and myself formed a portion of the party we can endorse the accuracy of your narrative, and can bear testimony to the excellence of the enlargements made by M. Lambert from the *carte* print supplied to copy from.

But I have something further to say. My son and I visited M. Lambert the next day, and we heard described and saw produced other results which time did not permit on the first visit. The method of reproducing negatives was made clear, so that the new ones shall not only be as good but sometimes even better than the original ones; for in the reproduction the faults of over-exposure and under-exposure can be modified if not corrected, and stains, markings, cracks, and other defects can be removed. For the reproduction of negatives carbon tissue is employed—not the ordinary kind used for printing, but a special description invented by M. Lambert.

Under the term "Lambertype" seems to be comprised the many necessary expedients taught by M. Lambert to change, modify, enlarge, or to reproduce the negative, so that in the final negative shall be comprised all that is required without any work whatever being necessary excepting the taking out of casual spots in the ultimate print. "Lambertype" is, therefore, a general term for a number of useful, and indeed valuable, methods of increasing the value of original negatives that have been brought together by M. Lambert. Many of them are not new, but they are novel in their application, while others really belong to himself—at least so far as my knowledge goes. "Lambertype" may, therefore, stand for improved negative work; it is all associated with the negative, and is independent of any method of printing that may be adopted.

"Chromotype," on the other hand, has nothing to do with the negatives. It is a modified form of carbon printing that cannot be worked without coming into collision with the Autotype Company. The two parties have, therefore, made arrangements together, so that the special tissue can be obtained from the Autotype Company. I have had considerable experience with carbon as a substitute for silver printing, and I am much pleased with M. Lambert's modification and with his ingenious printing-press and photometer. They will all help to make permanent printing more easy and more popular.

In connection with the chromotype I may mention that there was shown to us an easy way, by light washes with specially-prepared colours, of colouring these carbon prints. The results, though not calculated to interfere with good miniature work, are better than the common run of low-priced coloured work. The apparent effect of many hours' work is produced in as few minutes, together with the advantage that it is hardly possible to lose the likeness. Seeing that the result is produced so rapidly, and that it does not require much artistic skill, it seems to supply, even when done at a low rate, a source of remuneration to the artist. Nearly all new processes require fresh, and sometimes expensive, apparatus. Those of M. Lambert seem an exception to the rule; for, excepting the chromotype presses and the photometer, no other apparatus is required than is found in the meanest photographic studio. I am not sure that this is an unmixed advantage, but it is a fact nevertheless. The same lens that suffices for producing the *carte* or cabinet may be employed to make the enlargement, and almost every dark room may be used as an enlarging camera. If anyone be contented with silver printing he need not depart from it, as nearly all the advantages comprised in the term "Lambertype" may be secured without deserting our old friend—silver.

M. Lambert is evidently a very able and skilful photographer. He is full of ingenious appliances, and as his improvements are chiefly based on the common method of working one is able at once to estimate them; but to fully appreciate the value of his work one must really see him operate.—I am, yours, &c., Jabez Hughes.

*June* 22, 1875.

### LONG EXPOSURES BY THE ORDINARY WET PROCESS.

*To the* Editors.

Gentlemen,—I have lately taken the photograph of a drawing-room, giving an exposure of three hours and three-quarters; and, from the copy which I forward you, you will perceive that there are no markings on the negative showing that the developer did not flow smoothly. I managed this long exposure by pouring on and off the plate several times (after sensitising in the ordinary bath) a mixture made up of one part of glycerine to three parts of ordinary bath solution and a few drops of alcohol.

After the exposure, and on taking the plate from the dark slide, although it had not the usual dusky appearance of an ordinary plate become dry, still I had no hope that the developer would flow smoothly over its surface. I therefore again poured on and off several times the glycerine and bath mixture until I obtained an even, wet coating to the plate. The developer, of course, now flowed over in a perfectly even manner, and the plate developed slowly. This, however, was due to under-exposure, the photograph having been taken between the hours of five o'clock and a quarter to nine o'clock, a.m., with a Ross's 8 × 5 B doublet, and the largest stop but two of this lens.

It is my opinion that by thus treating the plate it might have been exposed several hours longer and have given a good negative. The glycerine mixture was exposed to daylight till it ceased depositing.

I claim no originality in the above treatment of wet plates, but simply wish to record my experience for the benefit of others having to give long exposures.—I am, yours, &c., A. G. de Tejada.

*London, June* 21, 1875.

[The print enclosed is very fine, showing no traces of inequality of development, and but the very faintest signs of under-exposure. —Eds.]

### "URANIUM AND ITS USES."

*To the* Editors.

Gentlemen,—I have been requested by several correspondents to address a few remarks to you on a paper bearing the above title, read before the South London Photographic Society by Mr. Werge. It is, however, so full of errors and so valueless as a guide to work that I

must content myself with pointing out one important error and one important omission, as to go in detail through the errors and omissions would occupy too much of your space.

Mr. Werge says:—"It is useless to add uranium to the printing bath with the hope of obtaining any beneficial results, and I think that fact has been sufficiently proved by the unenviable *soubriquet* of 'worthless type' having been bestowed on the Wothlytype process."

I am surprised that in a paper read before a scientific society Mr. Werge should betray his ignorance of the fact that the Wothlytype process, as worked in England, was a method of printing *on collodion*, and not by means of a printing *bath* at all. Of what value can statements be founded on such absolute ignorance of what has been done in photographic work?

The omission to which I allude above is that nitrate of uranium added to a highly-sensitive emulsion for negative purposes enables it to be kept indefinitely. I am now using the ends of a bottle of Chambers and Co.'s uranium emulsion five months old and still in perfect order, the latter quality being due entirely to the addition of nitrate of uranium.

Mr. Werge's paper is merely a record of his own ideas as to uranium, the value of which may be gauged by his want of knowledge of the way in which that salt was used in the Wothlytype process. Talking of that process, I may say that the most artistic photographic prints I ever saw were produced by it, and that of a very large number of Wothlytypes I have had since 1864 not one has faded in any degree, which I cannot say of some silver prints of the same age.—I am, yours, &c., H. STUART WORTLEY.

*June* 22, 1875.

## "RESIDENTS OF VITREOUS ESTABLISHMENTS," &c.

*To the* EDITORS.

GENTLEMEN,—In your last week's issue I notice a letter under the above heading, and signed "D. Winstanley." Now, Gentlemen, I would, through you, ask Mr. Winstanley if, with his experience in journalistic matters, he considers mild attempts at jocularity or the settlement of private disputes to be of a specially edifying nature to the general readers of your Journal, or of a character to sustain the reputation of that Journal. From Mr. Winstanley's usual choice of subjects I should judge him to be one whose tastes tend in the direction of the higher branches of science, and it seems to me, therefore, a matter for regret that he should occupy both his own time and your space in the profitless task of quarrelling with his critics.

I wish Mr. Winstanley to take these remarks in good part, and would also apply them to others who frequently occupy your columns with useless controversy. I shall not be led into arguing this matter any further; and apologising for intruding these remarks, I beg to subscribe myself,—Yours, &c., MORE WORK AND LESS TALK.

*Manchester, June* 21, 1875.

## *RE PETITIO PRINCIPII.*

*To the* EDITORS.

GENTLEMEN,—The title of Mr. Winstanley's letter is about the best thing I have seen for some time. Looking at it, and what is appended thereto, reminds me of an expressive Yorkshireism to this effect—"Awpenny head and fardin tail."

I quite agree with him that it is a rule with journalists not "to indulge in a certain style of reasoning," &c., &c. In this case, at least, Mr. Winstanley supplies the exception required in order to prove the rule. It was, and is, my impression that a latency (if I may use the term) of light was implied in the case of the alleged "continued action." In the experiments detailed, to which Mr. Winstanley refers, I did say of certain films that "light was perfectly excluded" by their enclosure in a box, the specific object of which was to avoid any post-lighting of the tissue, and to give the latency (if any) of the ante-lighting the full opportunity of acting. The whole burden of my song was to prove that this implied agent had no existence in fact.

He who says, as my friend Mr. Winstanley does, "a notion is ungrounded and unworthy of being entertained," certainly chooses a ready mode of disposing of any argument. "He may wave his hand and cry creation is not, and for the number who dispute his fancy might as well believe his cry;" but when he proceeds to censure others for "razing" such notions as one who wastes his time, he is first bound to show that such notions *are* ungrounded. How has Mr. Winstanley done this? Certainly not by saying "the continuating agent, if any such there be, manifestly is not the light, but something which acts where light is not." If that is not begging the question I don't know what is. The analysis of his argument is this:—Because A, B, and C produce a given effect, it is absurd to suppose that D might give a similar light. Whatever may be the general opinion, mine is that time and labour are *not* misspent which show the absence of any agent hitherto supposed to be present.

While Mr. Winstanley and myself are probably of one mind in the matter of continuating action, I know we shall agree—and mentally, if not physically, shake hands thereon—that it is illogical, accompanied by a number of adjectives mutually agreeable as applicable to such conduct, to charge another with wasting time by coolly begging the question in dispute.—I am, yours, &c., W. E. BATHO.

*Halifax, June* 19, 1875.

## "SPIRIT PHOTOGRAPHY UNDER A CLOUD."

*To the* EDITORS.

GENTLEMEN,—Mr. Newman, of Folkestone, has called my attention to a leading article published in your Journal of Friday last, headed as above, containing certain misstatements about me having no foundation in fact; and, as they would be of an injurious nature if believed, I have to ask you to correct the same in your next issue.

In the opening paragraph of the article referred to the following observations occur:—

"Some remarks that have appeared in this Journal concerning M. Buguet—a Parisian photographer who, it was alleged, obtained 'genuine' spirit photographs—have brought down upon the heads of the Editors no small amount of animadversion. Was not the genuineness, it was asked, of the spiritual origin of the Buguet photographs attested by Mr. W. H. Harrison, a whilom contributor to this Journal, and the present editor of the *Spiritualist?* and did not a whole host of *dilettanti*, including the names of some who stand very high in science, say it was all correct? And were not the uncles, aunts, grandfathers, grandmothers, and other relatives of several of the sitters recognised in these photographs? All this, we admit, is quite true."

The statement that I have attested the genuineness of the spiritual origin of Buguet's photographs is incorrect. I only saw Buguet at his work once, and published the results of my observations in the *Spiritualist* of June 26, 1874. In that article I described what I saw without comment, and the only remarks I made bearing upon the genuineness of the photographs or otherwise were the following:—

"I offered to take the negative myself, he (Buguet) merely standing by to get the influence of his mediumship upon the plate. This he declined, saying that the manifestations were more likely to be successful if he handled the plates and chemicals throughout. * * * Obviously it is not possible to say much about spirit photography on the slender experience of observing one experiment; but I do not know how to produce by artificial means a similar picture under like conditions."

That is all I know personally about Buguet's manipulations. The additional face on the picture I saw taken was not recognised by the sitter. Further on in your article you say:—

"Although it is not many months since M. Buguet left this country acccompanied with such honour as the spiritual periodicals could pay him, and with the pecuniary gleanings already indicated, one journalist, Mr. Harrison, now writes—'M. Buguet has turned out to be a thorough scoundrel. He has made a confession in which he asserts that he has *never taken any genuine spirit photographs.*' This statement, be it observed, is simply a quotation. But what, it will be asked, has given rise to such a great change in spiritualistic opinion?"

There is no truth in the above statement about my change of opinion. Last Friday (when your publication was informing your readers that I am now making different statements about Buguet to those I made when I saw him) I was at the residence of a notary connected with the Court of Queen's Bench making a legal deposition to be *viséed* by the French Consul and given in evidence at Buguet's trial. In that deposition I said:—

"I saw Buguet taking photographs on one occasion only, and the account which I published in the *Spiritualist* of June 26, 1874, I hereby declare to be true."

In the first paragraph quoted in this letter you say that the names of some who stand very high in science have attested the genuineness of the spiritual origin of Buguet's photographs. This statement is not correct; the only person very high in science who saw him taking pictures in England was Mr. William Crookes, who only saw the operations once and told me that he could discover no trickery, but from the general appearance of the results thought that some very clever imposture was at the bottom of the whole matter.

The only attestation I have seen of the genuineness of Buguet's photographs in England, written by a person who understands photography, was published by the Editors of THE BRITISH JOURNAL OF PHOTOGRAPHY on the 24th of July, 1874. The witness was Mr. J. Beattie, of Clifton, and his statement, as published in your Journal, was the following:—

"I sent a clever artist to his (Buguet's) studio, and on the plate he got a likeness of his mother who had been dead for fourteen years. I say nothing of the production; there was and could be no doubt of the likeness, and no likeness of her exists except a poor daguerreotype taken of her body after death."

I desire to make no comments about the above quotations. What I actually said is here placed in juxtaposition with what you told your readers that I said, and they can judge between us in this matter.—I am, yours, &c., WILLIAM H. HARRISON.

*"Spiritualist" Newspaper Branch Office,*
38, *Great Russell-street, London, W.C., June* 15, 1875.

[This letter reaches us when at a very considerable distance from home and under circumstances which render a reference to the files of the *Spiritualist*, the *Medium*, or any of the other authorities on matters spiritual simply impossible. On our return to London we shall revert to the subject.—EDS.]

## EXCHANGE COLUMN.

Wanted, a whole-plate rolling press in exchange for a good whole-plate French portrait lens.—Address, Mr. Mitchell, 25, North-bridge, Edinburgh.

I will exchange a good landscape lens, by Ross, for plates 12 by 10, for a posing chair or other useful accessory. Difference adjusted.—Address, H. Mirfin, 3, King-street, Darlington, Co. Durham.

I have for exchange an electric machine, Leyden jar, &c., cost 40s., for a good folding camera stand or anything useful in photography. Any reasonable offers taken.—Address, John Gunston, 53, Lewisham High-road, New Cross, S.E.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

W. H. F. (Belper).—Pyroxyline is said to be soluble in linseed oil containing various other substances in solution. This formed the basis of a patent taken out some years ago.

Thomas McKay.—It would be impossible to give you any reliable information without a plan of your studio with its surroundings. Judging from the prints sent we think you use too much top light.

Robert Bridgart (Derby).—1. The lenses of the back combination of your orthoscopic lens should be placed close together without the ring.—2. You can obtain chloride of copper from any dealer in photographic chemicals.

W. Kirk (Walthamstow).—*Chemistry*, by Professor Wilson, published by Messrs. W. and R. Chambers, would suit you; or, if you wish for a more advanced work, we should recommend Fownes's *Manual of Chemistry*.

Erratum.—We are requested by Mr. M. Carey Lea to correct a misprint in the quotation from Dr. Vogel, as given in a footnote on page 245. In the second line of this note the word "respective" appears as "*respect erlich*."

Ph. Doré (Nantes).—The landscape lens may be used for astronomical purposes, but the focus will not be sufficiently long to produce images of any considerable size. If, however, a sharp image be obtained the negative may be subsequently enlarged.

John Gunston (Ramsgate).—1. The "exchange" you will see is attended to in the present number.—2. Yes.—3. The last few numbers of this Journal contain the fullest possible details of Mr. M. Carey Lea's process.—4. The address of Messrs. Hopkin and Williams is 10, Cross-street, Hatton-garden, E.C.

Wandering Photographer (New Brighton, Cheshire).—1 and 2. We are not yet prepared to give directions respecting the preparation of the plates; but this is the less necessary at present as they are now articles of commerce, and can be easily obtained of fine quality.—3. Alba varnish is a preparation that dries with opaline whiteness.

"Smashem."—It has been frequently stated in our pages that wooden dishes are of great use in washing and fixing prints. The wood should receive several coats of shellac varnish. For holding silver solutions baths of wood may be employed, but in that case it would be necessary to heat the wood and impregnate it with paraffine, or, better, with white wax.

A. U. Erskine (Penrith).—We cannot tell you where the washing powder you mention is to be obtained. If you do not wish to be at the trouble of preparing the mixture recommended in the article you refer to, we should advise you to try Mr. M. Carey Lea's detergent, viz., bichromate of potash one ounce, sulphuric acid one ounce, water forty ounces. This will remove the most refractory films.

Sceptic.—Your friend is perfectly correct; it is not only quite *possible* to photograph the moon, but the exposure required is extremely short. The lunar photographs you mention were taken direct, and not from drawings of the moon, as you imagine. You have evidently failed to recognise the difference between direct and reflected light. It is practically impossible to photograph a landscape by moonlight.

F. J. (Birmingham).—If you mix the two salts together before solution you will experience no difficulty in dissolving the necessary quantity of ammonium bromide. That salt is soluble to a much greater extent in alcohol if cadmium bromide be present. Sulphuric ether of s. g. ·730 is quite good enough; it is better, however, to employ alcohol of a higher strength than you use, as it permits the addition of more water to dissolve the silver nitrate.

F. J. W.—The use of wax before coating the plate with collodion is not only allowable, but is an improvement. Dissolve white wax in ether and rub a little over the plate, polishing it off afterwards until no trace is visible. There still remains on the plate sufficient wax to make the film separate easily. In the case of the transparencies you enclose, you have not thoroughly dissolved the albumen substratum. Did you filter the milk before adding it to the gelatine?

Alick S.—It is not a matter of great importance whether the chloride of copper be anhydrous or not if used only for intensifying. Hydrochloric acid does *not* produce the same effect. It certainly converts the silver image into chloride, but that is not sufficient. The copper salt appears to exercise an effect peculiarly its own, and we think it probable that it enters into combination in some way with the silver of the image, and is subsequently reduced by the alkaline developer to the state of oxide.

H Cl.—The only effect of evaporation would be to *weaken* instead of *strengthen* the acid. You do not appear to understand its composition. Pure hydrochloric acid is a gas which is soluble to a very large extent in water. The liquid of commerce is an aqueous solution of the gas—the strongest commercial acid, containing about forty-two per cent. of real acid, its specific gravity being about 1·21. It may be obtained of as low a density as 1·12; and is frequently contaminated with iron and other impurities.

K. S.—The matter is one upon which we are scarcely able to advise you. No doubt proper guarantees will be given to all licensees upon payment of the fees. The remarks in the latter portion of your letter are, to a certain extent, correct; but it should be borne in mind that new processes of this description claim to produce a certain result with the exercise of less skill, or with a given amount of skill, to produce a better result than the old ones. Artistic feeling cannot be acquired by the payment of a monetary consideration.

Aspen Bank.—The permanganate of potash is to be added a few drops at a time. The first addition will cause turbidity, which may be removed by filtration. When the clear solution shows a permanent tinge of pink the operation is complete. It is unnecessary to remove the pink colour.

"Spirit Photographers" Sent to Prison.—As a sequel to what we wrote on the subject of spirit photography three weeks ago, we extract the following from the *Daily News* Paris correspondence:—"A strange trial has taken place before the Correctional Tribunal of Paris, and it has resulted in the conviction of certain 'spirit photographers' for swindling. Buguet, a photographer, allied himself with M. Leymarie, the editor of the *Revue Spirite*, who wrote about him and published *facsimiles* of his portraits, and with an American named Firman, from whom he learned the art of persuading people that he could, if they only willed strong enough, conjure up and photograph a likeness of any deceased relative or friend. For a long time the firm did a large business. Twenty francs was the ordinary fee, but many wealthy people voluntarily paid 2,000, 3,000, and even 4,000 francs. Never was a fraud more clearly proved. The operator's spirit box was produced in court; it contained hundreds of portraits of men, women, boys, and girls of all ages. When customers came desiring spirit portraits a young lady, who acted as cashier, adroitly engaged them in conversation in the waiting-room, and generally contrived to find some indications of the physiognomy of the person whom it was desired to evoke. Then one of the numerous heads was selected, stuck upon a doll dressed up in muslin, and a hazy portrait of a spirit was produced from it. Buguet guarded himself by saying he could never guarantee a likeness, because much depended on the strength of faith of the applicant, and, moreover, spirits were very capricious, and sometimes when you called for one another would come; but in very many instances the force of imagination was so strong that his dupes believed they saw the portrait of their relatives. They burst into tears, fell upon their knees, kissed the photographs, and were profuse in expressions of gratitude to the professor as well as lavish of gifts to him. Notwithstanding the palpable exposure of the imposture in open court a host of respectable witnesses, including a Russian marquis, the Comte de Bullet, Mr. Sullivan (formerly United States minister at Madrid), two French colonels, and several ladies appeared for the prisoners, and, undismayed by the sarcasms of the presiding judge, protested that they really had seen unmistakable portraits of deceased relatives. The court sentenced Buguet and Leymarie to one year's imprisonment, and Firman to six months'."

Mr. Moody's Photograph.—The Irish Court of Exchequer has been engaged hearing a case in which a Dublin artist named Smith claimed £190 on foot of an agreement from a Mr. Norman, described as a jeweller. It appears that when Messrs. Moody and Sankey visited Dublin the plaintiff attended their services, and from time to time made manuscript notes of the lineaments of Mr. Moody's face, from which he painted a portrait of Mr. Moody. He got a photograph taken from this, which he showed to Mr. Norman, knowing that the latter took an important part in the services. Mr. Norman declared that it was a very good picture; that he would make money of it, and asked how much he would take for it. The plaintiff said he would take nothing less for it than £200. Mr. Norman said he would be willing to give him that sum, but that he could not spare so much out of his business, but would be willing to give him £200 for it at his convenience. This offer was accepted by the plaintiff, who drew the attention of the defendant to the facilities for the multiplication of photographs afforded by the Woodbury process. It was contemplated that 25,000 copies should be struck off, and that, after paying the £200 to the plaintiff, it would leave a balance of £400 or £500 to the defendant. Eventually an agreement was signed in the following terms:—"To Mr. R. G. Norman. Sir,—In consideration of my photograph of Mr. D. Moody, the eminent preacher of Chicago, being successful, and for the sum of £200, I resign to you my entire claim to the profits which may arise from its publication, and I promise not to publish it myself or to interfere with its sale." Mr. Norman subsequently went to London and made arrangements with the Woodbury Company and with Messrs. W. H. Smith and Son for the publication of the photograph. On the 15th of April the plaintiff went to Messrs. W. H. Smith and Son, in Dublin, and ascertained that the profits of the sale in Ireland up to that time were £40. He then applied to the defendant, but could only get £10 from him, he stating that it had not succeeded, and that he had lost money by it. All further applications to obtain more money from the defendant had failed, and the action was brought to recover a balance of £190. The defence was, in effect, that the attempts made to sell the photograph had proved a dead failure, and that the defendant was out of pocket considerably by the transaction. The Court ultimately nonsuited the plaintiff, Mr. Norman agreeing to give him a sum of £50.

CONTENTS.

THE BRITISH

# JOURNAL OF PHOTOGRAPHY.

No. 791. Vol. XXII.—JULY 2, 1875.

## THE DEVELOPMENT OF PAPER NEGATIVES.

Since we wrote a fortnight ago upon paper as a substitute for glass we have had the pleasure of publishing Mr. Warnerke's very ingenious and successful method of bringing about the same end. That gentleman's process and the one sketched out by ourselves differ but little in principle though the manipulations vary to some extent, especially in the matter of exposure.

The dark slide described in Mr. Warnerke's article supplies a want long felt. In constructing a roller slide on that principle the great stumbling-block has always been the winding-off of the correct length of paper for each exposure. It is obviously impossible to so arrange that by giving a certain number of turns to the milled heads the proper quantity will pass over the rollers, for with each successive exposure one roller will increase and the other decrease in circumference; but by the method proposed by Mr. Warnerke the greatest precision is secured.

Our object now, however, is to supplement our former remarks by giving as clear a description as possible of the process as we have worked it ourselves, but more especially of the development and subsequent treatment of the pellicular negatives. As regards the latter portion of the process we do not think that materially different treatment would be necessary in case Mr. Warnerke's plan be followed; but not having yet tried it we are unable to say with certainty. In the first place comes the preparation of the paper. This, as we remarked last week, is not a difficult matter if care be exercised; but it is one of those operations which are much better performed on a large scale by persons who make it their business. Hence, we again throw out a suggestion to our friends the paper manufacturers and albumenisers, and trust that at least one among them may have sufficient enterprise to take the lead in what must one day be an important branch of the business.

The method of preparing the paper which we recommend to amateurs, though perhaps not the best possible, is the one which will, we think, give the best results with a minimum of trouble. It will be borne in mind that we do not recommend our own plan of preparing the paper as better than Mr. Warnerke's, but simply as one which will better suit the ordinary amateur.

Take a sheet of plain photographic paper, if such can be obtained—if not, the ordinary albumenised will do; if preferred, the albumen may be removed, the paper being afterwards dried as flat as possible. Pin the sheet upon a smooth board by the four corners, and brush over it with a broad camel's-hair brush a four- or six-grain solution of india-rubber, and allow it to dry. This may be repeated two or three times. The paper is next floated for a few seconds on a sixty-grain solution of gelatine. The gelatine must be used warm, the dish containing it being placed in a larger one containing hot water. Having seen that there are no air-bubbles on the surface of the liquid, take the sheet of paper by the two opposite corners and lower it on to the gelatine, in the same manner as in sensitising, and allow it to float from fifteen to thirty seconds. It is then to be lifted quickly and dexterously by the two corners at one end, and placed immediately in a horizontal position for a few minutes until the gelatine has set, after which it may be hung up to dry, which will occupy from six to eighteen hours, according to circumstances. The drying is the most troublesome part of the process, as the paper has so great a tendency to curl up. If it be possible the sheet should be attached by the edges to a board whilst drying, when it will be perfectly flat. This, however, is inconvenient if many sheets have to be dried at once. A very good substitute for the board is the following:—Procure a number of strips of wood a little longer than the paper, about half-an-inch broad, and the eighth of an inch thick; also a number of American clips. After the sheet of paper has been removed from the gelatine bath, and has been allowed to set, lay one of the wooden strips along the end of the sheet, allowing it to cover about the eighth of an inch of the gelatine surface; place a second strip behind the paper, and bind the two together by means of the clips. Proceed in the same manner with the opposite end, when the sheet may be hung up to dry. If necessary a slight weight may be suspended from the bottom strips of wood, so as to slightly stretch the paper while drying, and when dry it will be found to be quite flat.

As few amateurs have practised the coating of large surfaces with collodion, it will be well to cut up the prepared paper into suitable sizes, according to the dimensions of the plates usually employed. Some will, indeed, prefer to cut the paper into small pieces before treating it in the manner already described; but this we do not consider wise, as less trouble will be experienced in drying flat the full sheets than the small ones thus obtained. It will prove to be an economy of time and labour to cut the paper sufficiently large to make two or four negatives of the size required, allowing a slight margin for cutting off the defective edges. Thus the quarter of an ordinary sized sheet of paper would make two 8 × 5 or 5 × 4 negatives, with ample allowance for defective edges.

In coating the paper with collodion it may either be pinned to a smooth board or attached to a glass plate. In the former case a useful piece of apparatus consists of a piece of thin board, very little larger than the paper used, having in the centre of the under-side a handle similar, in fact, to a bricklayer's mortar-board. Upon this holder the paper should be pinned by the corners, using *black* pins for the purpose. The corner at which the emulsion is to be poured away should project the eighth of an inch clear of the wood. If glass be used the edges of the paper must be carefully turned over the glass so as to leave the surface perfectly flat; it is then coated in the ordinary way.

A few words about the exposure. As Mr. Warnerke writes last week, it is better in the case of large plates to expose behind glass in order to have a flat surface; though taking care in carrying out the instructions given a fortnight since it is quite practicable to employ the method we then spoke of. We have now a sheet of paper, sixteen inches by fourteen, which has been for more than a fortnight attached by the edges to a plate of glass in the manner indicated, and which shows not the least tendency to leave the glass.

But for small plates the suggestion we have previously made, together with Mr. Warnerke's plan of using ferrotype plates, form the most convenient and portable means of effecting the exposure. Care must, of course, be taken to ensure that the paper is laid down

perfectly flat; this, however, is easily done with the aid of a "squeegee," and when once laid, if the cement be properly made, it will not separate prematurely.

In storing the paper we should advise emphatically that it be kept flat, as in a book, rather than in rolls. The "curl" given in the latter case would prove most objectionable in the subsequent operations.

The development of the tissue negatives which we have described differs in one important point from Mr. Warnerke's method. That gentleman removes the paper support previous to development, while we retain it until the negative is completed. The only effect of this is to necessitate, perhaps, a little extra care in development in order to avoid staining the paper; but that is an accident which very rarely occurs when ordinary care is used. The impregnation of the support with india-rubber renders it waterproof, and consequently the different solutions have no access to the fibre of the paper. It may be asked why it is objectionable if the paper should become stained, seeing that it has to be removed before printing. We reply that not only does it prevent the formation of a correct idea of the density of the negative, but stains in the paper originate stains in the film, which cannot be removed.

The solutions we employ are the ordinary ones in use for emulsion work, with the exception that we employ a stronger solution of bromide than usual, viz., twenty grains to the ounce. To perform the development we take the exposed paper and float it, paper side downwards, on a dish of clean water, taking care not to wet the sensitive surface. After floating for a minute or two it is laid still wet upon a glass plate, and brought into contact by means of a squeegee. Or the exposed paper may be attached in its dry state by means of the cement previously described; in that case, however, it is liable to wrinkle during development, which gives a great deal of trouble.

Transferred to the plate the development of the paper negative proceeds precisely as in the case of a glass one, only using a larger quantity of bromide in order to keep the paper as clean as possible. Before fixing, or the use of silver for intensifying, if such should be necessary, it is well to allow the paper to soak for a short time in a very dilute solution of acetic acid, the paper being removed from the glass for the purpose. After fixing and washing thoroughly the negative is to be dried between the leaves of a blotting-book—not, under any consideration, by hanging up in the same way as a print, for such a course would inevitably ruin it.

When dry a variety of courses are open as to what shall be the ultimate state of the negative. It may be transferred to a glass support; it may, by being coated with gelatine or collodion, form a pellicular negative; or it may be allowed to remain upon the paper which formed its original support. If a glass negative be required, the developed tissue should be floated for an instant upon a warm solution of gelatine; this may be done immediately after fixing and washing, and previous to drying it. If a reversed negative be required it is placed at once upon a clean and warm glass plate, the surface of which is covered with the same gelatine solution, and the two are brought into intimate contact by the "squeegee." When dry, the india-rubber paper may be removed by soaking in benzole, and the remaining negative varnished. If a non-reversed glass negative be required a double operation will be needful, the film being first transferred to gelatinised paper, and from that to the final glass support.

But we think that glass, dispensed with in one part of the process, will be done away with altogether; and it is therefore to the pellicular form of negative that general attention will be given. There are two forms of pellicle suitable for supporting negative films, viz., collodion and gelatine, each having its special admirers. To apply the former the paper negative is fastened to a flat surface, and is coated with a four-grain solution of india-rubber; when dry, this is followed by a coat of collodion made as follows:—

| | |
|---|---|
| Ether and alcohol (equal parts) | 1 ounce. |
| Pyroxyline | 9 or 10 grains. |
| Castor oil | 6 drops. |

When this is dry the paper may be removed by means of benzole, and the negative is complete. If gelatine be employed the coating of india-rubber is unnecessary, but the gelatine must be rendered insoluble.

## AN IMPROVEMENT ON THE ROTARY PRINT BURNISHER.

One of the characteristics of the present time is the superseding, by means of suitable mechanism, of the hand labour or primitive methods usually employed in connection with new inventions when first introduced, and the operations associated with which are thus simplified and facilitated to a very important extent. There is not, it is true, *much* room in photography for a development of the mechanical faculty, but still occasions now and then arise in which labour becomes greatly aided and lightened by the adoption of obvious contrivances of this character, and such is the one we are now about to describe.

During a recent visit to the "far north" we saw in a studio in Kirkwall, the principal town of the Orkney Islands, a mechanical contrivance of a simple yet most effective kind, the general adoption of which would, it struck us, be attended with advantage, more especially in establishments where a large amount of business of a high class is executed. The studio alluded to was that of Mr. John B. Russell, which, far removed as it is from what has been designated the "centre of information," we found replete with a large and well-selected assortment of chemicals and requirements for the production of photographs by the methods most recently introduced. The improvement we shall now describe is in the direction of the burnishing of prints.

When, in previous articles, we directed attention to Weston's rotary burnisher we spoke of the advantage of a slow, and the necessity for a uniform, passage of the picture over the face of the polished steel bar. In the burnisher we saw in use at Kirkwall both of these important features were secured in an efficacious manner, added to which was also another improvement, the value of which will be appreciated when we say that the motion of the feeding-roller was not only uniform, but *continuous*, this action being secured in such a mode as to leave at liberty both hands of the operator using the machine.

The winch-handle by which the roller is rotated had been removed, and in its place was substituted a large grooved wheel or pulley, over which was passed a band. The burnisher was erected on the top of a firm stand like that of a small turning-lathe or large sewing-machine, fitted, like both these instruments, with a somewhat heavy fly-wheel, put in motion by the usual crank and treadle appliance. On the axle of the fly-wheel was fixed a pulley of similar form to that we have described as being on the feeding-roller of the burnisher, but of much smaller diameter—reversing, in point of fact, the usual relation existing between the driving-wheel and the pulley in turning-lathes and sewing-machines. In these the rotation of the fly-wheel is greatly multiplied by means of the band and pulley; whereas the speed by Mr. Russell's arrangement is very much diminished, the feeding-roller revolving much more slowly than the fly-wheel but with greater power, thus adopting the antithesis of the mechanical maxim—"What is gained in speed is lost in power." The respective diameters of the two pulleys are ten inches and four inches, the upper one, as we have said, being the larger.

By the arrangement here described the burnishing of prints becomes a very simple operation, and one which can be performed with great rapidity; for, as the mechanism is driven by the foot and the motion continuous, the operator is at liberty to employ both hands—one in feeding the burnisher, and the other in withdrawing the prints and placing them in piles. In practice it is found to facilitate labour to such an extent as to have enabled Mr. Russell to wholly discontinue the use of the ordinary print-rollers for photographs, and to finish all his pictures by the burnisher.

This additional mechanism is well worthy of being copied and utilised; for, although it involves only a slight pecuniary outlay, its great value is at once apparent. The fly-wheel of an ordinary sewing-machine may prove too light, especially for a burnisher of large

dimensions; but, if so, no difficulty will be experienced in procuring a wheel sufficiently heavy for the purpose from any maker or dealer in turning-lathes. Should, however, as a consequence of our remarks, a demand arise for this useful adjunct to print burnishers—which, we are glad to perceive, are being introduced all over the country—we have no doubt that the well-known enterprise and energy of the dealers in photographic appliances will not permit such a demand to remain long unsatisfied.

## CONCERNING DEVELOPMENT.

On page 443 of our volume for 1873 we made a few suggestions on the method of developing the latent image on wet collodion plates by solutions of iron of various strengths successively applied; and although we are aware that the system is advantageously practised by a large number of photographers, we also know that it is not by any means so extensively utilised as we think it deserves.

With a view to arrive, if possible, at some tolerably clear understanding of the cause of the different results obtained by solutions of iron of various strengths we recently undertook to make a series of experiments, the results of which we now propose to record; and, although they can hardly be said to have added much to what was previously known in connection with the subject, they nevertheless may be found to contain some useful hints to those who have neither the time or the inclination to experiment themselves.

The experiments were made with seven solutions of iron, ranging in strength from five to fifty grains per ounce, with twenty drops of glacial acetic acid in each, and a thirty-five-grain solution of silver made slightly acid with nitric acid. In each of seven test tubes half a drachm of the silver solution was placed, and to this was added, from graduated pipettes, two drachms of each of the solutions of iron, and the reactions were carefully watched. In the case of the stronger solutions the action was almost immediate, the liquid becoming turbid, and a black, streaky deposit attaching itself to the sides of the tube, while the weaker solutions remained for some time unaltered; and even when decomposition set in the liquid only got slightly opalescent, while the silver, with bright metallic lustre, was evenly deposited on every part of the tube covered by the solution. At the end of six minutes the stronger solutions, down to twenty grains, had completely reduced the silver to the metallic state, as was evidenced by the fact that no precipitate was produced in the filtered solution by the addition of a chloride, while in the case of the five- and ten-grain solutions the contents of the tubes gave traces of silver after the expiration of two hours. The deposited material was then carefully washed and collected on slips of glass, and an attempt made to measure them and compare them by the aid of the microscope and micrometer; but as this was found more difficult than we expected, and as we had an idea of arriving at that information in another way, it was abandoned.

In connection with the tube experiments, we wish to direct attention to the fact that the decomposition invariably commenced at the surface, except in the case of two experiments in which the solutions were mixed in an atmosphere of nitrogen, when no such effect was observed. We shall allude to this further on, as we think it has a bearing on the question of development that is worthy of more attention than it has secured.

Slips of glass were then coated with collodion for an inch or so at one end, and sensitised by being dipped into the silver solution and exposed to a gas flame for five seconds each. On the application of the various solutions of iron very marked differences in the results were seen. The weaker solutions, up to twenty grains, did not begin to act for a few seconds, and then the plate got gradually darker and darker till the action appeared to be complete, the result being a deposit that had a fine cinnamon colour, and which under a half-inch object glass appeared simply as a stain. The stronger solutions—and that just in proportion to their strength—commenced the reduction almost instantly, and soon became quite black and granular, although not so much so as to be susceptible of micrometric measurement. The difference, however, was so marked that even an inexperienced eye could have little difficulty in seeing that the slips developed by the weaker solution would form the basis of much better printing negatives than those which had been acted on by the stronger solutions.

In the hope of being able to measure the average size of the particles of silver deposited, a single drop of the argentine solution was placed on each of seven slips of glass, and to these were added, in each case, three or four drops of the iron solution, and the changes carefully watched under the microscope. Any attempt at measurement of that produced by the weaker solutions simply ended in failure, as the deposit, appearing at first as a faint stain, gradually got denser until the field of view became obscured; and when the silvery-looking globule was diluted with distilled water it only had the effect of reproducing the apparent stain without visible structure. But with the stronger solutions it was very different, as, although they also soon obscured the field of view, an addition of distilled water exhibited a mass of floating particles—some singly, and others adhering in patches—whose cohesive power was difficult to overcome, and the size of which varied from $\frac{5}{100}$ to $\frac{1}{1000}$ of an inch, while the single particles, in the case of the forty- and fifty-grain solutions, varied from the $\frac{2}{1000}$ to the $\frac{12}{1000}$ of an inch.

Now, setting aside altogether the fact that in various strengths of iron solutions we have the power of producing apperently equally-exposed negatives from plates which have received very varied exposures, and that an accidentally under-exposed plate may, by the use of a strong solution, be developed into a pretty good *cliché*, we think that even a plate which has received just the proper exposure may, by the judicious use of both weak and strong solutions, be made to yield prints of much higher quality than could be got where only one was employed. There are, no doubt, still many photographers, and a still larger number of the general public, who regard with pleasure, and as the highest aim of the art, the smooth, ivory-like faces of their pictures; but we think there is as little doubt that better taste is gradually gaining ground, and that in a short time even the general public will refuse any picture deficient in the flesh texture which is such a charm in all good photographs.

Now we believe that this desirable texture can be most readily secured by the use, in the first place, of a weak solution of iron—say of ten- or, at most, fifteen-grain solutions. This should be allowed to act till a good foundation is laid—that is, till the detail is completely out—and a fully-developed but thin negative is obtained. If, then, a forty- or fifty-grain solution be applied, the result will be not only the rapid production of sufficient intensity, but, in consequence of the larger size of the particles deposited, the acquirement of that semi-granularity of which the desired texture seems to consist. We know that in practice many have discovered this long since, and we strongly recommend those who may not have yet devoted attention to the subject to give it consideration and a fair trial.

We have already said that in the experiments with the test tubes the action invariably began at the surface and gradually extended downwards. The true explanation of this we are not at present able to give, but we think the fact is capable of utilisation. Some time in 1873 an American artist made a communication to the Berlin Photographic Society on what was called "pneumatic development," in which he proposed to get local intensity by blowing the developing solution off the parts on which he wished to get increased action. His communication was received here with at least some ridicule; but there really seems to have been more significance in the proposition than was at first sight evident. We are aware—and we believe Colonel Stuart Wortley was the first to call attention to the fact—that, in the alkaline development of an emulsion plate, when the solution seems to stick, or intensity has ceased to increase, if the developer be poured off and the plate exposed to the air for a few minutes a marked increase in density is obtained; and from our experiments we have no doubt that a similar action takes place in the development by iron of an ordinary bromo-iodised film. For local development, however, there is a far better "dodge," which we have long used, but which does not seem to be generally practised. Everybody knows that development goes on much more rapidly at high than at low temperatures, and it is the

application of this fact to which we here allude. Near the developing sink we have an elastic tube attached to the gas-pipe and terminating in a small jet. When, in the course of development, we find a portion of the negative—such as a black velvet jacket, or other dark piece of drapery—refusing to take on the necessary silver, the jet is lighted, and the flame, not larger than a pea, brought to bear on the spot of glass immediately under the part, when, as if by magic, the desired effect is at once obtained. This is so simple in application and so thoroughly successful that we heartily commend it to the attention of our readers.

We have received a second communication from Mr. H. J. Newton, of Philadelphia, which will be found in another column. In a private letter Mr. Newton speaks very highly of the process he is now working; and although we have not yet had an opportunity of testing it, we have strong faith in the opinion expressed by our correspondent. The most noteworthy point in connection with the process is the method of development recommended. Mr. Newton speaks of the use of plain pyrogallic solution for the purpose of bringing out the image, stating that this solution may be used over and over again without losing its developing powers. This, we think, is scarcely correct. We need not remind our readers of the powerful affinity which pyrogallic acid has for oxygen—an affinity so great that it will absorb that gas even if exposed to the atmosphere in a dry state. All dry-plate workers know how rapidly a solution of this acid decomposes. That the same solution may be employed a second time we have no doubt—that is, if no alkali be used; but with the statement that the pyro. solution can be *kept* and used repeatedly we are unable to agree. On this point we think that Mr. Newton has scarcely given us his full meaning. As regards the use of tannin in the developer we believe Mr. Newton has introduced a novelty. We had intended, after reading our correspondent's last communication, to put his new developer to the test; but we have as yet been unable to do so. Tannin, it is well known, exerts a powerful influence on the development of an image by the alkaline method, and was last year mentioned as a substitute for the soluble bromide usually employed as a restrainer; but we are not aware that it has been previously used in connection with silver development. One point we would specially note, viz., that many samples of pyroxyline refuse to give any image whatever with plain pyrogallic solution, though the smallest addition of alkali may be sufficient to bring out the picture in its fullest detail.

## THE INFLUENCE OF COLOURED FILMS ON THE PHOTOGRAPHIC IMAGE.

When, some time since, Dr. Vogel announced the discovery of the influence of coloured films on the image of the spectrum, the supposed action struck me as so opposed to the laws of actinism, and so completely negatived by what I had seen of the influence of colour in the film, that I made a few experiments which, though they brought no confirmation of the hypothesis of Dr. Vogel, gave me some other noteworthy conclusions.

I found that certain samples of pyroxyline when emulsified gave transmitted white light an orange tint, others a red, and others still a distinct violet. This difference will no doubt have struck all careful emulsion workers, and has been noticed by the Editors of The British Journal of Photography; and they will have discovered also that the density of the image obtainable was generally in proportion to the depth of this transmitted orange or red. I have prepared samples of different cottons by identical treatment, in one of which the extreme violet and the other the extreme red were obtained, and, with one exception, have found this colour to indicate closely the density obtainable under ordinary sunlight.

The experience suggested a probable solution of the otherwise inexplicable results reported by Dr. Vogel; but, on testing the samples with an addition of aurine sufficient to give a decided colour to the film by reflected light, I found that no relative change was induced by any addition up to that which brought general fog from insensitiveness, and that not only the violet film was not made sensitive, but that by transmitted light it was as violet as ever.

What was at first sight inexplicable was another difference in the action of the films, viz., that between the results obtained by direct exposure in the camera and that under a negative either by gas or diffused daylight, samples of emulsion which gave density and a certain degree of sensitiveness under the latter circumstances utterly failed in the camera, no matter what the exposure. One of these samples—which had been prepared from my own pyroxyline made from cold acids, and which gave admirable surface, great opacity, and seemed in transparencies all that could be desired—gave in the camera a thin, superficial image, to which no printing value could be imparted by any treatment. In some samples the addition of tannin or gallic acid gave greatly improved results, and in others no improvement whatever.

In this connection experiments recorded by Becquerel come to throw light on my own and those of Vogel, viz., those in which he employed a film of chlorophyl in addition to that of collodion, and found an increased sensitiveness to red light. But it is a well-known fact that chlorophyl is sensitive to red light, which decomposes it, itself being green; that is, it reflects the green light and absorbs or transmits the red. And this is just what my good bromide films had been doing. In broad daylight there was no perceptible difference in colour between the good and the worthless films, and chemically they were the same in combination. It was only in transmitted light that the colour of the film was apparent, and it is evident that some differences in the pyroxyline, not to be detected by any ordinary method of examination, had given the emulsion the power of stopping the light and converting it into chemical action, and this irrespective of any colour in the material itself.

In the course of my experiments on various pyroxylines I have found such great differences in sensitiveness that, I am confident, I should be able to show a range of sensitiveness greater than that between the various haloids of silver in samples of emulsion made according to the same formula in every respect except the use of one and another sample of pyroxyline. In other words, the minute trace of some organic substance which is formed in one sample of pyroxyline and not in another will have an accelerating effect on the haloid of silver greater than the difference between the quickest and slowest of the haloids. In some cases I calculate it at about 1 : 3, while that between an iodide and bromide in dry plates is hardly more than 1 : 2.

This would explain a multitude of discrepancies between the results of various experimentalists; and if I extend the range to those samples of cotton which obstinately refuse to receive any impression from light we have an indication of the presence of an agent sensitive to light, and whose independent existence has not yet been detected, a perfect knowledge of which might revolutionise photography.

It becomes easy in this light to understand how the gelatine film may be more sensitive even when dry than any collodion film wet; how some experimentalists may have found a rule that will not work both ways; and how success with a formula may, even more than we have suspected, depend on a sample of cotton. With a cotton that gave a violet image I have obtained more satisfactory results with iodide in the emulsion than without it; and with a bromide emulsion in a certain state I have obtained films more sensitive than wet collodion, while with *the same* in a different state I got one much less so. This may explain, also, how a film of iodide of silver is so much more sensitive when saturated with solution of nitrate of silver than when isolated, and many other apparent anomalies.

In short, like the French cook's pebble soup, the basis of an emulsion is much less important than what we happen to prepare it with. While it does not change our views as to the relative sensitiveness of the haloids for certain definite purposes, it may make us less positive as to the results we are to obtain with any of them when used in certain ill-understood combinations of organic matter.

If I am right in my speculation the facts so noticed may have a far higher importance in pointing out what may yet be done in scientific photography. If it be possible to fix with certainty the conditions which are now so inexplicable, and add to our *materiel* those substances which, like chlorophyl, increase the actinic range of the film, or, like gelatine and the undetected modification in pyroxyline, to the sensitiveness of the haloids or other basis of photographic operations, science will gain an enormous advantage in all points where photography is now of use. Dr. Vogel's theory that this is to be obtained from colour is clearly not borne out; but the fact that the aniline colours, from which he obtained his notable results, are decomposable by light, when separately exposed, points to a probable explanation in accordance with the hypothesis I have given above.

W. J. Stillman.

## NOTES ON PASSING EVENTS.

By a Peripatetic Photographer.

As regards the uses of uranium I am unable to agree entirely either with Mr. Werge, who asserts that it is worthless, or with those who attach importance to the stability of prints produced by its agency. There is one use to which it may advantageously be put, which is very far indeed from being unknown, but which has received very little attention at the hands of photographers. It is that of mixing and using it in conjunction with nitrate of silver as a sensitising bath for paper—not used alone, mark you, but mixed with the silver in precisely the same way as in the Wothlytype process, omitting the collodion, which in that process is used as the vehicle by which it is applied. Among the advantages of this mixture is the smallness of the amount of silver necessary to sensitise paper, and the length of time that paper prepared in this way remains good after being sensitised. The chemical action, too, is really beautiful. As the light acts on the nitrate of uranium it converts it into a reducer of the silver with which it is mixed, and the picture is thus a developed one, the developing action commencing as soon as the light acts upon the uranium and makes it a developer. The light also acts upon the silver, which darkens from this cause as well as from the influence exercised by the uranium. Vigorous prints have thus been obtained from a ten-grain silver bath *plus* nitrate of uranium. I do not believe, however, that prints produced in this way are necessarily more permanent than ordinary silver prints, whether, as in the case of the Wothlytype, these are faced with collodion or not. In any case they are merely silver prints, and—"nothing more." Wothlytypes are, from this cause, just as liable to fade as prints produced in the usual mode; and although Colonel Wortley has not seen any faded prints of this kind, it is, nevertheless, certain that some such exist, which, as they bear the stamp of the "United Association," may be assumed to have received due care in their treatment.

"Spirit photography" is, sure enough, "under a cloud" at last, when on the chief actors in the concern which recently flourished in Paris has been inflicted a long term of imprisonment. Buguet had many English patrons, and, as a consequence, has many sympathisers. I have not seen very many of his spiritualistic productions; but, out of two or three dozen that I have examined, it is impossible to arrive at any other conclusion than that nearly all of them were barefaced impostures. It is within the range of possibility that the example set by the French police may be followed by the "experts" of the London "force;" and, if so, spiritualistic photographers and editors will have to look out.

The three communications read at the last meeting of the South London Photographic Society came just in time to prevent that body from going into recess for the summer with the humiliating consciousness of having done but little important work during the past session. The reputation of "advancing backwards" cannot now, however, justly attach to that body, for more practical and suggestive papers than those alluded to have never been presented on one evening. Mr. Warnerke's idea of using ferrotype plates as a substitute for glass upon which to take negatives is excellent, although attended with the drawback of not allowing the operator to watch the development by transmitted light, unless the film be first removed from the metallic plate and attached to a transparent one. Still the paper supports advocated by him will obviate this objection.

How Mr. Hooper felt prompted, and was permitted, to read a paper advocating the use of sulphocyanide of ammonium as a fixing agent passes my comprehension. Had he but merely glanced over the back volumes of this Journal he would have found that its use had been condemned long since in the most unequivocal manner by every person who had tried it. In not having made himself acquainted with the labours and recorded experience of others before bringing such a subject before the notice of the leading Society in the country, and, further, in "strongly advocating" a thing which he does not appear to have tried, he has done injury not only to himself but to the Society through whose instrumentality his paper was given to the world. I trust that the London Photographic Society will lay the lesson to heart, and lose no time in appointing a committee whose duty it will be to examine all papers before they are permitted to be read at its meetings.

The subject of dry plates and foreign custom-house officers, introduced by Mr. Horatio Ross, admits of easy solution. Mr. Ross should not take any prepared plates with him from this country, but in their place a bottle of very thick collodion emulsion, the bottle being one of the ebonite kind now so easily procured. On arriving on the continent, and when ensconced in his hotel, let him dilute a small portion of the thick emulsion with ether, which can be obtained in every continental town, and then coat as many plates as he is likely to require before he passes any other frontier at which his packages run the risk of being examined. The modern mode of preparing plates by emulsion is so extremely simple that no trouble whatever would be entailed by the method to which I have directed the attention of this enthusiastic amateur.

## ON EMULSIONS.

[A communication to the Photographic Section of the American Institute.]

In my former paper I promised to communicate to you the results of further experiments with the bromide emulsion. Before speaking, however, to the main point I would like to call your attention for a few moments to the substratum or preparatory coating of the plates, as it is an important element in the successful working of dry plates. It has been found that albumen prepared in the ordinary way would not answer the purpose, as the alkali employed in the development would soften the albumen sufficient to loosen the film from the glass. I found that albumen dissolved in water with ammonia was much more readily dissolved, after having been dried, than a plain solution of albumen.

After trying several things to preserve the albumen I adopted carbolic acid in the following proportions:—In eight ounces of water dissolve the albumen from one egg (if dry albumen be used take ninety grains); then into another vessel containing eight ounces of water put sixteen drops of carbolic acid. After the albumen is thoroughly dissolved add the eight ounces containing the carbolic acid. Plates prepared with a substratum of this albumen effectually resist the action of the alkali developer. I have not had the first indication of a blister in all the plates I have made with this substratum. The formula which I have adopted is twelve grains of bromide of cadmium in collodion made as I gave it in my former paper, to which eighteen grains of nitrate of silver is added. Eight or ten hours after add three grains of chloride of cobalt. The chloride can be added dry, if finely pulverised, and the emulsion frequently shaken during the first few hours afterwards.

Since we last met I have been trying bromide of magnesium, expecting, if I succeeded, to obtain a film which would flow more evenly than that salted with a cadmium bromide, especially when new. The first ten days of my trial with the magnesium salt rewarded me with nothing but disappointment and fog. The first lot I made, however, which is now over two weeks' old, begins to show very promising results, and I anticipate being able in a few days to produce superior negatives with this emulsion.

In my former paper I expressed doubt in being able to compound a preservative which would work more satisfactorily than the one I then gave you; but there was the fact, which I stated, that it was decidedly acid, and I purposed to try the squills without the syrup. Some of them I soaked in cold water twenty-four hours, and some I steeped in hot water two or three hours, adding one ounce of alcohol to every six ounces of the solution. This made a preservative which gave more sensitive plates than my former preservative. The bitter quality of the squills, however, suggested nux vomica, the bitterness of the two being the same so far as the taste could determine. I therefore was induced to try the nux vomica, and compounded a preservative as follows:—

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|---|---|
| Water | 16 ounces. |
| Tincture of nux vomica | 5 drachms. |
| Laudanum | 3 ,, |
| Alcohol | 2 ounces. |

This preservative is simple, easily prepared, and will keep. The negatives which I shall exhibit here tonight were prepared with this preservative, and will speak for themselves. For brilliancy and the general good qualities desired in a negative I do not think they can be surpassed. I have therefore adopted this preservative, and shall adhere to it until I find something better.

I am of opinion that ten or fifteen grains to the ounce of gum arabic will increase the sensitiveness, and shall give it a trial. Some object to gum arabic in the preservative on account of the tendency of the film to blister in the development. I do not think that this will occur with plates prepared with the substratum as I have given it. If trouble should arise from this cause, the development can be accomplished without the alkali quite as satisfactorily without additional exposure. Proceed in this way:—Make a solution of pyrogallic acid in water, anywhere from six to twelve grains to the ounce. After the plate has been washed flow it with this pyro. solution until the image appears and the detail is all out; then pour the pyro. back into the bottle, as it can be used for any number of plates, its deve-

loping power not being exhausted by repeated using. Then flow the plate with a solution of tannin and pyrogallic acid, six grains each to the ounce of water. After flowing off and on a few times, or until the action has become even over the plate, pour it off into a bottle containing eight or ten drops of a plain silver solution in water, twenty grains to the ounce (this is for a $5 \times 8$ plate), and again flow the plate. The intensity will immediately begin and go on until the silver is exhausted. If sufficient density has not been attained wash the plate and repeat the operation, using, however, one-half the strength of the developing solution and silver. You will not find it necessary to repeat the operation more than twice. I am of opinion that more satisfactory negatives can be obtained in this way than by using an alkali. If after fixing they should be found too weak they can be readily strengthened by proceeding as follows:—Make a strong solution of iodine in water with iodide of ammonium, and to three ounces of this solution add half-an-ounce of muriatic acid. Add enough of this stock solution to an ounce of water to give it a good orange colour, and flow the plate with it a few times and wash off. If the plate has become dry wet it before flowing with the acid iodide solution; after thoroughly washing flow it with the pyro. and tannin solution, using half strength, pour off as before into a phial containing a few drops of the silver solution, and proceed as when developing in the first instance. A little acetic acid should be added to the pyro. and tannin solution.

The film which this emulsion gives is very dense, making it thereby unnecessary to use any backing for the plates. If, however, any one should be using plates which require backing, there is a very simple way of doing it, which I adopted last fall. It is as follows:—Take two ounces of syrup or molasses, and add to it four ounces of water. Pour this into a dish and lay in it some sheets of black paper, or any other coloured paper which is opaque; lay them down with a glass rod or triangle, and cut them a little smaller than the plate. After the number required is in place your finger on one corner of them and pour the syrup solution back into the bottle for future use. Let them drain well, and take the dish containing them into the dark room; and when your plate is in the holder lay one of the sheets of paper on the back of it, rub out the air-bubbles, and the backing is complete. There is just adhesive power enough in the paper to make the contact with the glass complete and to retain it in its position. When the exposure has been made the paper is readily removed and can be used in the same way again.

H. J. Newton.

## NOTES FROM THE NORTH.

We are now, or should be, in the height of the photographic season. The inhabitants of the cities have not yet betaken themselves to the enjoyment of the glories of the sea coast or the quiet pleasures of more rural quarters, and the usual influx of tourists from all quarters of the globe have already made their appearance; yet photographers are complaining of business being dull, and, so far as I can see from occasional visits to most of the principal studios in Edinburgh, they are not complaining without some cause. What can be the reason? Certainly it does not arise from any want of enterprise on the part of the photographers themselves, nor in consequence of any deterioration in the quality of the work done, as it is year by year getting really better and better. Neither does it arise from any disinclination on the part of the general public to get themselves photographed, as landscapists well know, to their great inconvenience, that whenever the lens is directed to any particular object anybody and everybody who may be within an easy distance make all possible haste to plant themselves just in the position where their presence is most undesirable. Can it be that the public are tired of the omnipresent *carte de visite*, and are waiting for the introduction of some novelty? I am much inclined to think that this is the case, but have not an idea as to what the attractive novelty is likely to be. Neither the cabinet, the imperial, or the boudoir have taken the public fancy, and the successor of the once popular *carte de visite* has still to be sought for. Here is a rich field for the ingenious mind to cultivate, and I am sure that whoever can hit on something that will by its popularity give an impetus to the present declining professional business will richly deserve the thanks of all concerned, although I have grave doubts as to his getting such a reward.

The connection between photography and fancy-dress balls may not at first sight be very apparent, nevertheless photographers might do worse than lend a helping hand in the organisation of such exhibitions. We recently had such a jocund gathering in this city, at which several hundreds of the "upper ten" disported themselves for a number of hours, dressed in the costumes of all countries and of all periods, from the days of our first parents downwards, very much to their own satisfaction and not a little to the profit of the proprietors of several of our photographic establishments. Inseparably connected with such assemblies there is always a large amount of personal vanity, which tends to provoke the desire of some of the gay revellers to have themselves immortalised in their representative dresses—when, as they modestly imagine, they are "the observed of all observers"—and so the photographer's services are called into requisition rather extensively. I would, however, earnestly urge my professional readers, unless they can command the services of a first-rate colourist, to have nothing to do with such commissions, as uncoloured fancy dresses are simply hideous, and always fail to give satisfaction to both photographers and their *clientèle*, to which must also be added the further disadvantage of lowering, in the opinion of sitters, the ability of the artist, as the former, especially those of the gentler sex, cannot be made to comprehend why what looked so well in all the varied colours of the spectrum, and under the blaze of artificial light, should make such a poor display when shown in monochrome on a small card. When well coloured, however—especially when the primaries are largely in the ascendant—they are very effective and generally give satisfaction to all concerned. This was at least the case in connection with the ball recently held here, as I know that several establishments did much on this exceptional occasion to redeem the slackness of the season in consequence of the additional artistic work induced by this *bal paré*.

Speaking of colours reminds me that, a few days ago, I saw in a reception room a very good plan for showing the intending sitter the effect of any particularcolour specially desired. The photographer had often been troubled by inquiries as to the most suitable dress in which his visitors should come, and had experienced much difficulty in convincing them that certain bright colours would in the photograph be white, or nearly so, while others equally bright would show almost black. To make the explanation more impressive he had arranged a dozen pieces of ribbon, side by side, on a card. The ribbons were about a foot in length, and represented all the colours and the various shades of each, from indigo to red. This was photographed the size of itself, and both original and copy were placed in one frame, and hung in the room. The frame, measuring $24 \times 12$, was decidedly ornamental; and, as the ribbons and their copies were arranged end to end, there was no difficulty in seeing at a glance the photographic effect of any colour or shade that might be in question.

Having an hour to spare, some days since, when on a visit to a not unfashionable seaport town within a few hours' ride of Edinburgh, I called on a rather eccentric photographer. Judging from his specimens and the work in hand he appears to secure a pretty good amount of business, and yet exists in the most entire state of ignorance of all recent improvements. He had never even heard of collodio-bromide, and actually smiled at my ignorance when I told him that it was quite possible to get pictures without a bath. Until a few months ago he had been using, and that quite to his own satisfaction, the old fixing and toning bath, and it was only on the occasion of the laying of the foundation stone of a new town hall, when he had secured the assistance of a photographer from Edinburgh for a few days to help him in the execution of a large order, that he was induced to try the acetate of soda and gold. Of Lea, Cooper, Wortley, Stillman, and other household names he was profoundly ignorant, and of course I was almost "flabbergasted" when he made the painful confession that he had never even heard of *my* name! With that of Sutton he was quite familiar; and it was the mention of that name that gave me the key to the otherwise unaccountably benighted state in which I found him. He told me that he had read Sutton's recommendation of the tunnel studio, and immediately set about constructing one for himself. He was, however, so disgusted with its behaviour that he pulled it down, and swore that he would never read a line of a photographic journal again! Of course I remonstrated with him on the absurdity of such a resolution; but he assured me that he did much better than some of his neighbours who read the photographic publications regularly. He seemed only half convinced when I assured him that he owed his comparatively good position to his somewhat rare genius, and that if he could do what he had done without the journals he would undoubtedly have done ten times better work if stimulated by their aid and influence. He promised to think over the matter, and I have little doubt, should I have the opportunity of giving him a call six months hence, I shall find considerable improvement in that quarter.

Photographers, especially emulsion workers, find the family of dropping-bottles, pipettes, and dropping-tubes articles of great use; but as they generally cost money, although not much, they are not so freely used as they ought to be. During a recent visit to a zealous disciple of collodio-bromide I saw in use a number of dropping-tubes that were very handy and cost "next to nothing." Each dropper consisted of a piece of glass tube about the thickness of a quill and four inches in length. One end was drawn to a point large enough to admit an ordinary needle, or it might be a little larger; and on the other was slipped one of the rubber teats used for infants' feeding-bottles. The teat was of the description having only one leech bite by way of hole, and this remained closed unless pretty firmly pressed, but could be made perfectly tight by a single touch of glue. The tube was graduated with spaces, each containing five minims, by scratches with a file or diamond, and all that was necessary was to gently press the teat with the forefinger and thumb, dip it into the solution, release the pressure, and of course the tube filled itself. In this way, by gentle pressure, any number of drops could be measured most accurately. The tubes were passed through corks which fitted the bottles, and as the latter cost less than three-halfpence each quite a large number could be got for a modest sum. My friend used his solutions in a nearly concentrated state, and kept them in a uniform set of bottles, each holding two ounces, and of the kind known in the glass trade as the "short series." As each bottle had its own tube, which also answered the purpose of a cork, there was no delay in washing the tubes or inconvenience from the mixing of the chemicals.

I had thought that by what has been written in the journals, and through the influence of the exhibitions of the exceedingly fine pictures supplied by Mr. York and others, the public taste, especially the taste of what may be called the "educational public," had been raised to such a pitch that at last the rude hand-drawn lantern pictures of other days were things of the past. It would really seem, however, that in England at least, and amongst the class where it is most required, the standard of excellence for lantern pictures is extremely low. A few weeks ago there was held in Edinburgh a convention of the heads of the various industrial schools throughout the country, at which a host of philanthropic people were present. On one particular evening it was announced that a public meeting would be held in the Museum of Science and Art, and that the bill of fare would include, amongst other attractions, "an exhibition of dissolving views." Why an exhibition by a single lantern should be so generally called "dissolving views" I cannot divine, unless it be that when the oxyhydrogen light is managed by inexperienced hands it so often vanishes. Well, the exhibition consisted, in the first place, of some exceedingly fine photographs of the Industrial Brigade and Ragged School children at various kinds of work, and of some of the training ships in Scotland. This, however, was considered but the prelude to the exhibition of various English homes, of which there were a large number of pictures. Of all the exhibitions I have ever seen this was certainly the worst. The pictures were so badly drawn and so hideously painted that they only elicited a smile of pity for those who had paid a considerable sum of money for such worthless trash; and it is to be hoped that before holding another convention the various heads of industrial schools will add to the branches already taught that of photography, and so be able to show properly the various places to be projected on the screen, give examples of the work of the pupils, and make a really creditable exhibition.

John Nicol, Ph.D.

## FOREIGN NOTES AND NEWS.

The Berlin Photographic Society.—Experiments with Schulz Sellack's Paper.—Wood Spirit.—A New German Photographic Journal.—A Floating Studio.—Remelé's Decoration.—Uranium Dry Plates.

The Berlin Photographic Society has held its annual meeting for the election of officers and reviewing its position.

The President said that it would require strenuous efforts on their part even to keep their present place amongst similar societies. He pointed out that, under the presidency of Dr. Hornig, the Vienna Society had made great progress both in respect to the number of new members admitted and the regularity of attendance at the meetings; that the Belgian Society already numbered 200 members, though it had been such a short time in existence; that in England alone there were eight societies, including three societies of amateurs; and in America fourteen societies, one of which—that at Chicago—had just celebrated its fifteenth annual festival; and that really Germany would be nowhere if she did not take care.

Dr. Vogel, who seems to be the mainstay of the Society, was then re-elected President *in absentio*. The various members of the Society who undertook to test Dr. Schulz Sellack's new paper have given an account of their labours.

Herr Schaarwächter took three specimens of the paper and floated them for a minute and a-half upon his usual silver bath and fumigated them for two hours with ammoniacal vapours. He then printed a picture from the same negative upon the bromised, the chloro-bromised, and the ordinary (chloro-) albumenised specimens of paper. By means of Vogel's photometer he ascertained that the chloro-bromised printed more quickly than the bromised, but there was no particular difference of time between the chloro-bromised and the ordinary paper, though the image on the bromised paper was somewhat grey, and seemed to be printed more in than that on the ordinary albumenised paper.

Herr Prümm had obtained similar results—beautiful prints, clear in the whites and deep in the details—with the common albumenised and chloro-bromised papers, but somewhat unsatisfactory prints with the bromised paper. But he had not observed that the bromised paper printed more slowly than the others. He thought well of the chloro-bromised paper, as by an equal mixture of those salts good prints were obtainable from negatives that were too hard for the common albumenised paper.

Dr. Schimann did not approve of fumigation; he preferred to add pulverised carbonate of ammonia in the pressing-pad, as, when the paper was fumigated, the ammonia evaporated during the printing.

One of the members having remarked, when speaking of the methylated iron developer, that various preparations were sold under the name of "methylated alcohol," most of which contained fusel oil and alcohol,

Dr. Byck replied that the preparation meant was wood spirit, and obtainable at any chemist's under the name of "pure methylic alcohol."

Herr Schaarwächter said that when he was in Holland he had often used wood spirit not only in the developer but also freely in collodion and varnish, and had never observed the slightest difference between it and common alcohol. The great difference in price was the only inducement he had to use it. It was an incidental product in the large Dutch pyroxylic acid manufactories, and was not dear; while absolute alcohol, on the contrary, was not manufactured in Holland at all, but was imported, thus being liable to an import duty of about two shillings in the pound, which made it very expensive.

Dr. Byck referred to a notice of nitrate of baryta being employed in the negative bath as an accelerator. Upon which

The President suggested that a committee should be appointed to experiment with the so-called accelerators introduced from time to time. Before the meeting broke up a committee of four was chosen for this purpose.

The prospectus and first number of a new weekly photographic journal, published in Berlin, have just appeared. The first number of the *Wochenblatt*, as it is called, contained a full account of the proceedings at a meeting of the Berlin Photographic Society before it had appeared in the Society's own organ, the *Photographische Mittheilungen*—a circumstance which prevented the said Society from according to the new paper a very favourable reception.

We learn that there is now a floating studio in America; that is, a steamer fitted up with all kinds of photographic appliances and apparatus. This steamer is intended to trade for five years upon the Mississippi, and both portrait and landscape raids are to be made from it.

Herr Philip Remelé, who accompanied Rohlf's exploring expedition to the Lybian Desert, has been decorated by the Khedive with the order of the Medjidsche.

Herr Schlicht, of Potsdam, writes to the *Mittheilungen* to say that he tried Solomon's uranium dry plates, and was astonished to find them little less sensitive than wet plates. He had obtained very good portraits with them, and developed them with an alkaline developer.

## THE ENGLISH EXPEDITION FOR THE OBSERVATION OF THE ECLIPSE OF THE SUN.

The following communications have been sent by Dr. Vogel to the Berlin Photographic Society. The first is dated from Suez, February 27th:—

My hurried departure from Berlin has prevented me from sooner sending the Society an account of the purpose of this new eclipse expe-

dition, which has called me so suddenly away from my usual duties. As, on my part at least, unforeseen and involuntary detention at Suez leaves me with a little more time for writing than I have hitherto had at my disposal, I embrace the opportunity of remedying the neglect. My journey has hitherto been pretty fortunate, yet I have not been without mishaps, which in other circumstances might have proved fatal. On the day we intended to sail from Venice such a storm passed over the Gulf that the ship was unable to run out of port, and we were delayed twenty-four hours until the frightful storm of wind and drifting snow had abated.

The voyage soon brought us, however, to a more friendly clime, and at Brindisi one could already lay aside winter wraps. Unfortunately, a bad cold, which I caught before leaving Berlin, still stuck to me, and had scarcely left me when we reached Alexandria. As we left Brindisi a slight accident happened to our ship. She lost two lifeboats in a collision with another ship, but little more damage was done, and we were safely landed in Egypt, and had two hours to spare for Alexandria. I was already acquainted with the town, but found many changes in it. One great improvement was the completion of the railway to the harbour, so that one has but a short distance to go from the ship to the train. Last time I was there the station was beyond the town, and it took an hour to reach it.

At six o'clock p.m. a special train took us on to Suez, where we arrived at six o'clock next morning. Under these circumstances all we saw of Egypt was some groups of Fellahs crouching round a fire; for the night was as cold as the day was warm, and all the winter wraps were again in requisition. Arrived at Suez, we should have immediately gone on board the steamer "Surat," which had come from Southampton and was going through the canal, but we learned that the "Surat" had lost a screw, and we were invited to go on board the "Teheran" and remain there until the "Surat" should arrive; so we spent the day on board the "Teheran." In the evening the disabled "Surat" came at last, having on board three other members of the expedition—Dr. Schuster, Dr. Meldola, and Mr. Beasley—with forty-eight boxes of instruments and chemicals.

The "Surat" was so much damaged that she had to be put into dock, and the "Baroda"—with which I had come from Venice to Alexandria—was telegraphed for to come through the canal and take us to Ceylon. Meantime we remained on board the "Surat" until the "Baroda" arrived. The "Surat" was being unladen, and the noise that accompanied this proceeding was something frightful. Everywhere chests, bandboxes, trunks, portmanteaus, and casks were being pushed about, and what with barricades on land and barricades on board it was impossible to move. I heartily wished the business was finished and we were again peacefully afloat.

I have only just learnt my destination, which is Camorta, in one of the Nicobar Islands. Yesterday I got a telegram telling me not to land at Colombo, but to go on to Bombay, from thence by rail to Calcutta, after that to reach the end of my journey by one of the Indian government's steamboats. But I find that all that is not possible, for the ships for Bombay had already left the harbour before I was able to get my instruments from the hold of the "Surat," so I shall just go on to Ceylon with the other members of the expedition who are here.

As things are we shall hardly reach Ceylon before the 18th March, and it is a question whether there will be sufficient time after that to go on to Siam. One division of the party—Schuster, Janssen and Reynolds—still intend to attempt to go there. As for myself, I renounce that project, and shall remain at Birma, in the central line of the eclipse, where the totality lasts four minutes twelve seconds; that is, one minute twelve seconds longer than at Aden.

Now to go back to the purpose for which this expedition was sent out, and why it is divided into several parties. At Aden the task of the expedition is to photograph the form of the "protuberance;" that is, those carmine-red, flamelike appearances which burst forth during the eclipse far beyond the sun's disc. Quite a short exposure (five seconds) is sufficient for this. It is supposed that when these protuberances are photographed in India an hour later their form will have changed, and if so, their variable nature will be demonstrated, and their composition (principally hydrogen) will be ascertained. These protuberances will also be analysed by the spectroscope later in broad daylight. But for such observations an eclipse will no longer be required.

Observations are required of another puzzling appearance, called the "corona," which surrounds the sun like a glory during the whole of the eclipse. The form and width of the corona are very variable; its light is fainter and of a different colour from that of the protuberances. In the expedition to America, in 1869, it was necessary to expose a plate eight times as long to obtain a picture of the corona as for one of the protuberances. Since that time pictures of the corona have been taken in India, at Syracuse, &c., and its extremely changeable form has led us to suppose that, in this case, we have to do with a very rarefied, unsubstantial gaseous substance. However, all that is certainly known about it is, that, by the use of the spectroscope, Janssen has discovered that it contains hydrogen. When the spectral apparatus is properly adjusted and directed towards the corona the clear lines of the hydrogen can be distinguished; but, besides these, there are blue and violet lines, and in the darker part of the colour spectrum lines which the eye can with difficulty distinguish from black, the composition of which it is very difficult to determine.

This brings us to the question of the possibility of fixing these lines by the help of photography, and it is for the solution of this question that I shall strive. A telescope must be adjusted to the darkened sun, on whose lens an image of the corona will appear. To this picture the chink of a spectroscope will be applied and the spectrum, so created, caught by the aid of a photographic plate. A good, powerful telescope, capable of furnishing a sufficiently-strong image of the corona, will contribute more than anything else to the success of this experiment. Further: a powerful spectral apparatus will be necessary; if once the spectral lines are got it will be easy to determine afterwards, by measurement, their position at each of the chosen times, and when those data have been obtained it is to be hoped that the nature of the substances which cause the appearance will be discovered. Besides the foregoing, direct photographs of the corona will be taken; that is to say, without the intervention of the spectroscope, in order to ascertain the form of the corona. These last photographs offer no difficulty, and they will be taken by the spare photographers of the expedition. As for myself, I shall busy myself exclusively with the spectral views, and it is to be hoped the weather will not leave me in the lurch. This is such an interesting scientific expedition that it will be a subject of unceasing regret if all be spoiled at the last moment by the weather; but, in order not to leave everything to the few minutes of the eclipse, I propose (indeed I have already begun) to make detailed studies of the chemical strength of the light at the various halting-places in the course of the journey. The nature of these details and the manner of obtaining them I shall describe at another time. H. Vogel, Ph.D.

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*On board the "Baroda" near Ceylon.*

Our prospects are at present far from brilliant. Ever since we have been on the Indian Ocean the weather has been cloudy, and the mist has prevented us from seeing the blue sky in the gaps between the clouds, so that, photographically speaking, the sun's action is very weak. I am much disappointed, as from the sun's great altitude I expected the reverse to have been the case. For instruments I am even worse off than for weather!

The English invited me to join them and promised to provide me with instruments. These have just been unpacked, and I find that what have been placed at my disposal are mere children's toys. For instance: I have *no telescope but a common six-inch lens, one with immense diffusion of focus, and no camera.* This lens is placed upon a stand, and should reflect an image of the sun by means of a mirror fixed behind it upon which the sun's rays fall. Now the mirror should follow the sun's motions, otherwise the image may fall beyond it, and there will be nothing to photograph. The mirror should be made to follow the sun's motion by means of machinery, but there is *no machinery.* My assistant is supposed to draw it forward by hand! The explanation of this is not far to seek. It is "out of sight out of mind."

The two English members of the expedition, being on the spot when the instruments were given out, were able to take better care of themselves; they have telescopes with machinery and all the mountings required in order to ensure success in their difficult task. As for myself I look like the stork in one of Æsop's fables who was invited to dinner by the fox, and had soup set before her in a shallow plate, where, owing to the length of her bill, she could not touch it, while the fox easily lapped it up. So it is very likely that the Englishmen, who have learnt from my writings how to photograph a spectrum, may be successful whilst I may make a complete *fiasco.* Unfortunately for me I shall not be able to revenge myself as the stork in the fable did. My only hope now is that some of the Indian observers may have a telescope to dispose of, or that I may get one from the German Venus expedition, to which I have telegraphed at Singapore, where they are now engaged in determining the longitude. The most provoking part of the whole thing is that the Astronomer-Royal has allowed a usable telescope to lie unused in London from jealousy of the expedition, which was undertaken against his will.

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I have begun already to feel "the ills which flesh" in the torrid zone "is heir to"—the intense heat, the vapour-bath atmosphere, and what is called the "prickly heat." It requires great ingenuity to choose a posture in which sleep at night is possible, and we are very much inconvenienced by the large number of ladies on board. When I made my first voyage to Aden there was not a single lady on board the ship, and so we slept on deck, on the top of the saloon table, or wherever we liked. Tomorrow we expect to reach Ceylon, and then I shall see real tropical vegetation for the first time.

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I am glad to learn that we expect to fall in with Captain Waterhouse (the photozincographer), as I am already acquainted with him, and he speaks German. I hope also to meet Eschke in Ceylon, returning from the Venus expedition, and to take him on with me as my assistant.

Dr. Vogel then says he will set out on his homeward journey some time in June, and he hopes to bring with him a large collection of views

of all the places he has seen—not only such as he is able to take himself, but also a number of purchased pictures. In Aden he bought some fine unmounted 8 × 10 photographs for two shillings each, and similar ones at Suez for one shilling. He approves greatly of selling these views unmounted, as they are so much more portable for travellers; and he would like to see this mode of selling them more generally adopted in Germany.

## OUR CLUB.

No. VI.—Tom and I. Our Summer Tour. We Arrange.

It was a very warm afternoon. I remember it well—that summer afternoon when Tom proposed to me to go that working summer tour. Each of us had competent hands to leave in charge of our places, so we could take a stroll whenever it pleased us. On this day, tired out with a long walk, we threw ourselves down under an old oak tree to enjoy our talk in the cool shade.

"This beautiful weather thins the town, and consequently the Club, Mark," Tom remarked.

"Yes," I replied; "it would'nt be a bad thing to have it closed for a month or two in the summer."

"What do you say to trying a summer travelling trade? I think it would be awfully jolly," Tom said, raising himself on his elbow and looking into my face.

"Do you know, Tom, that's a pleasure I have dreamed of over and over again—a summer out, enough to pay your way, and with a congenial companion."

"Yes, Mark, the last is indispensable; for I went one summer by myself, and it was'nt nice."

"Indeed, Tom, I never heard of that. Where did you go to?"

"To Arran, of all places in the world, and it would have done well enough only it was a very wet season. Mind you, Mark, it's a slow thing to smoke a pipe by yourself daily without seeing the whiff rising from a companion's lips; you require a sympathy. When I went down there I thought of getting an introduction to the Duke of Hamilton; but the weather was very miserable, and I never had a chance of showing my work."

"And had you good quarters? Could you not get your landlord to smoke a pipe with you?"

"Why, my quarters were a 'caution!' I hired a little wooden house in the middle of a field—a sort of outhouse—three or four hundred yards from the nearest hut. I intended to do the hermit."

"I hope you enjoyed it, Tom."

"Enjoyed it! Bless your soul, I was nearly frightened out of my life the first night!"

"How was that? Did you see a ghost?"

"No; but I was firmly convinced in my own mind that my cabin was surrounded by a hundred devils! I was sitting reading by my lamp and enjoying a smoke (it would be near midnight) when a rush of many feet came scampering round and round my hut, and the most hideous sounds rent the air. I felt rather frightened. I extinguished my light and had a look through my little window, when I found that it was a lot of deer that had come down from the hill to enjoy a feed of potatoes, as was their wont. I suppose they had just taken a walk round to see who had come to the little house to live."

"You would be rather relieved than otherwise when you beheld the little *dears*, Tom."

"Yes! It's a good enough joke now; but, mind you, Mark, I felt rather queer for a bit. The thing would have been pleasant enough had it not been so stormy and continually wet. One morning I woke to find my habitation on an island, sir! I was completely surrounded by water!"

"I suppose you would swim for it, then?"

"No; I took a stool, and sat down in my doorway just clear of the watermark. Lighting my pipe I quietly waited for an hour or two till a straggler came my way, when for a shilling I had a bridge made of planks, by which means I got safely to shore."

"Well, Tom, you had enough of adventure if you hadn't much profit, but together we would have to 'go in' for a paying speculation. I'll tell you how it would have to be done. We would require to start with the tidiest horse and one of the smartest dog-carts in the country—a nice, quiet, unobtrusive 'get up.' Don't show them your hand at once, you know. We must not say by our appearance we are out trading and wait orders. None of that; but purely a pleasure trip, and, being artists, doing a little by the way. Then for samples (for all travellers carry samples), two or three portfolios filled with the best pictures we can produce—our own work—from *carte* size up to say 15 × 12. One of us will have to play the part of the traveller to introduce them and take the orders, whilst the other, with an assistant perhaps, will execute the work, and every other day we will send home the negatives to be printed."

"Not a bad picture at all, Mark," Tom said, with a laugh. "A very good little descriptive picture of how to do it. How much do you charge them by the dozen?" And then he sank into silence for a minute or two as he kept pulling the blades of grass and throwing them about. Tom was thinking. At length he ventured to remark:—

"I could do the work, Mark; but the order-taking is not in my line."

"Oh! well, as far as that goes, Tom, I'm your man for travelling; and you're my man for operator."

"All right!" he said, with a smile; and so it was arranged. Out of this random talk the project grew which was of some moment to both of us.

In making our arrangements the first thing we had to see about was the buying of a horse, and, not knowing its points, we made it a point to see a friend of mine who was "up" in horseflesh. Tom thought he knew a little about horses; but he didn't. The fact was he took it into his head to learn riding when Hengler's circus was in our town. He was to have twelve lessons for twelve pounds; but his first was the last in that school. He got mounted and rode round the ring two or three times very pleasantly, and Tom was just beginning to think that he would "like it fine," when his "wild horse of Tartary" made round the ring as hard as he could gallop, sprang over the entrance bar, and away through the doorway into the stable. Had Tom not slipped over his back on to the ground as the horse was performing this feat it would have been the old story of the beggar on horseback riding to ——. You know the rest. And a short cut, too, I fancy. So Tom left the choosing of the quadruped to my friend.

We bought a very pretty little horse and, oh! *such* a beauty of a dog-cart! and our scrap albums were got up with great care and considerable taste. Combining our experience we got together our working apparatus—the most compact and substantial that could be turned out.

Of course we had the usual amount of uncertainty and uneasiness which is always felt at the starting of a new venture—whether it will be a success; or if the people will smile and say it is "a sell;" or if the folks will be in the mood to have their pictures taken; and the other thousand-and-one shadows that will crowd the distance as you look into the future, but which gradually disperse as you move on. So we moved on.

Now fancy yourself on the top of that little hill on this bright sunny morning! Do you see that dry, creamy, country road like a streak of sunlight stretching far as the eye can see, set in between the fields and hedges of refreshing green? There is one moving speck on it. Do you observe it—away there to the right? Well, that is our carriage—"carriage" is a good word; some people would have said our "trap"—and Tom and I sit there jogging along with faces beaming through the curling smoke that's rising from our cigars, chaffing each other with hearts as light as that same drifting smoke. We drive on to the little village at the foot of the hills. Mark Oute.

# Contemporary Press.

## HOW TO GET CLEAR SKY IN OUTDOOR NEGATIVES.

[Photographic Times.]

Since my early days in photography I have examined photographic journals many times to find something that would throw light on this subject. Most architectural photographs have their skies worked out mechanically. The leading photographic writers urge strong objections against this practice; but when cloud effects cannot be obtained I am of the opinion that a clear blank sky is better than a uniformly dark one, which generally tends to make prints look flat.

This subject has been my special study for a year past. Experience has led me to the following conclusion:—If the sky appear uniformly dark blue to our eyes, or if there be any haze in the atmosphere, it will surely come out dark in the prints; on the other hand, if it be light blue, or if there are white clouds of any kind, it will act strongly on the negative, and the result is a clear, if not a perfectly white, sky in the photograph. Hence it is advisable not to attempt architecture in hazy days, unless you are going to paint out the sky. Another thing tends to help the getting of clear skies. Use as little acid as possible in your silver, and expose while the sun is obscured by a white cloud, which will remove harsh contrasts; and if the negatives lack intensity they certainly will gather some if you dry them in the sun before fixing. Try it.

In architectural photography swing-backs (both ways) are indispensable, yet there are still a few who have never used a swing-back camera-box. If you are troubled with the building taking pyramidal inclinations when the camera is inclined either upwards or downwards an adjustment of the vertical swing will at once correct it. The lateral swing will help in getting the distances into focus with the foreground without necessitating the use of a small stop. Especially is this the case when you have to take street scenes, when it is impossible to get those parts *near* the instrument into focus with those receding with a non-swing-back box. Ranald Douglass.

# Meetings of Societies.

## WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.

The first trip of this Society was such a success, and so many expressions of satisfaction on the day's pleasure were echoed at the

last monthly meeting, that a second out-door photographic ramble was agreed upon; and consequently arrangements were made for a tour up the Hebden Valley on the 24th ult.

The Hebden Valley is likely to occupy a conspicuous place in the photographer's guide book, should one ever perchance be published. The valley is regarded as the Switzerland of England. It has its range of mountains, its rugged peaks, its mill dams, its weirs, its waterfalls, its nooks and corners for the stereo. camera, its wooded hills and distant effects for the long focus lens—in fact, Hebden Valley is a paradise for the photographer. There he may feast to his heart's content, and drink in every sort of bliss that the "beer and albumen" or a "Howard tent" is capable of affording him. If he be the happy possessor of a tent that "holds everything, and just weighs 100 lbs.," or has a favourite corn or two, he should leave them at home, for the "improvement committee of highways" have not yet smoothed the path for the man or beast of burden that is likely to go in quest of the grand and beautiful. Hebden Bridge is near Todmorden, on the borders of Lancashire, but in the county of York, and only eight miles from Halifax.

The morning was fine and inviting in every sense but the photographic. The wind disturbed the composure of the foliage to such an extent that the votaries of both wet, dry, moist, and all other processes regarded the "refreshment" portion of the day's out as the most likely to turn out successful. Yet, notwithstanding the unphotographic aspect, the wet, the tannin, the beer and albumen, and the emulsion processes had each its representative amongst the party. The afternoon became overcast, and a sort of photographic "insolvency" prevaded the whole aspect of the beautiful valley.

The party sat down to tea at the "White Horse," Hebden Bridge, at eight o'clock; and, as many of the gentlemen intimated their intention of doing better with the ham-and-egg plates than they had with the tannin, a "comfortable" hour was spent in thoroughly testing the capabilities of the former process. After this pleasant repast the company returned home.

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The next meeting of this Society will be held at the Victoria Hotel, Bradford, on Monday next, the 5th instant, at half-past seven p.m., when one of Mr. George Hare's automatic changing-boxes will be exhibited.

# Correspondence.

## URANIUM AND ITS USES.

*To the* Editors.

Gentlemen,—Colonel Stuart Wortley's characteristic letter in the last issue of your Journal reminds me of the *dernier ressort* of "gentlemen of the bar," who, knowing that their client's case is a bad one, and having no evidence in his favour to bring forward, do their best to damage the evidence against him.

Colonel Wortley *assumes* that I was ignorant of the fact that nitrate of uranium was employed in *collodion* in the Wothlytype process. It so happens, however, that I was acquainted with the Wothlytype process, for I read the specification in the Patent Office *before* it was published, and I undertook the sale of the collodion, paper, &c., as soon as they were put into the market by the company. If the latter fact has slipped out of Colonel Wortley's memory it still remains palpable in a ledger in my possession.

In the paper read before the South London Photographic Society I did not enter into a description of the Wothlytype process, because I thought that photographers generally knew all that they could possibly wish to know about it. I had satisfied myself by actual experiment that it was useless to add nitrate of uranium to the printing bath. I knew how much time, patience, and money had already been spent and lost on the Wothlytype process; and I coupled, or wished to couple, the expression of my knowledge and experience on both points when I alluded to the worthlessness of the Wothlytype process. Perhaps it would have been better and more gratifying to Colonel Wortley if I had said—"It is useless to add uranium to *any* of the photographic printing processes." That is my conviction, and that is the real meaning I wished my words to convey.

That I was justified in making those remarks about the worthlessness of the Wothlytype process is, I think, fully borne out by the following facts:—1. The failure of the Wothlytype Company, of which Colonel Wortley was the managing director in London. 2. The deplorable collapse of the Wothlytype establishment in Paris. 3. The unsatisfactory experiences of Herr Kleffel, of Berlin. 4. The non-adoption of the process by any eminent photographer in this country. 5. The non-practice of the process in any part of the world at the present time. 6 (and lastly). The *non-use* of the process by Herr Wothly himself in his ordinary business.

The last-named is, perhaps, the most remarkable and curious fact of all, and I obtained the information from one who was two years in Herr Wothly's employ. The process was not practised *professionally* by Herr Wothly because of its uncertainty and vexatious behaviour both in his own hands and those of his *employés*. Herr Wothly is dead now, and I should think there is not another man living, excepting Colonel Wortley, who pretends to believe in the utility of employing nitrate of uranium in any of the photographic printing processes.

Colonel Wortley appears to cavil at my phraseology. He does not grapple with the vital question, but attempts to ignore the fact that my "ideas" were corroborated by experiments, that the results of those experiments were laid before a number of skilled photographers and competent judges, and that the record of my ideas and results of experiments were not only unchallenged but confirmed by the members of the Society who were present when the paper was read and the results exhibited. Had Colonel Wortley attended the meeting he would have seen examples of collodio-uranium prints, both on paper and on canvas. The results of my experiments are still in existence, and may be seen by anyone who is sufficiently interested in the subject being at the trouble of calling at my place of business to examine them.

Controversy, however, on the Wothlytype question is neither desirable nor worth entering into. The chief point at issue is this—"Does nitrate of uranium, added to the nitrate of silver bath, give increased sensitiveness in the *wet process?*" I say it does not, and have made a series of honest and careful experiments to prove the accuracy of my statement. Colonel Wortley had an *idea*, but instead of giving *data* to work from, or exhibiting a single example as evidence of his own success, he simply announced the bare idea and magnanimously wished to saddle the London Photographic Society with the cost, and its members with the trouble, of investigating it. The Society declined to appoint a committee of inquiry. I individually, and without any information from Colonel Wortley, undertook the task of investigating the subject. The results of all my experiments were miserably disappointing; the experiments of others were not more satisfactory, and the *data* and results of my experiments have all been published and exhibited. When added to the collodion I found nitrate of uranium the reverse of an accelerator. In the nitrate of silver bath I discovered it to be a serious retardent, and in the developer I ascertained it to be a powerful restrainer in the *wet process.*

If Colonel Wortley has by any possibility discovered the addition of nitrate of uranium, *per se*, or in combination with anything else, to be an accelerator in the wet process, why does he not publish his *modus operandi* and substantiate his statement by exhibiting evidences of his successes as openly and freely as I have exhibited evidences of my failures? Surely it must be easier for him to prove by demonstration and example that he is right than by mere words to attempt to prove that I am wrong. Colonel Wortley is a gentleman and the holder of a lucrative government appointment, and therefore cannot be actuated by the motives of a process-monger in withholding from the photographic world any of his photographic knowledge and experience. Having mooted the subject before the London Photographic Society, the Society having declined to investigate it, and individual experiment having failed to corroborate his statement, I consider that he is in honour bound to publish *his* formula, or in future maintain a judicious silence on all matters photographic.—I am, yours, &c., J. Werge.

11*a*, *Berners-street, W.*, *June* 26, 1875.

## PAPER FOR PHOTOMETRICAL PURPOSES.

*To the* Editors.

Gentlemen,—Dr. Nicol (as appears from the report in your issue of the 11th inst., page 286) expressed his fears at a recent meeting of the Edinburgh Photographic Society that "much difficulty would be found in making a paper that would be always equally sensitive, even if its manufacture were confined to one maker." If Dr. Nicol will refer to the *Philosophical Transactions* of the Royal Society, vol. 153, part 1, pp. 153 and 154, he will be pleased to find his fears without foundation; for on the pages named details of experiments undertaken to ascertain the "influence of the description of paper employed" are given, with the result that from the thickest to the thinnest of papers used in photography they have *no* influence on the sensitiveness of the film of silver chloride.—I am, yours, &c., D. W.

*June* 26, 1875.

## THE WOTHLYTYPE PROCESS.

*To the* Editors.

Gentlemen,—I venture to send a scrap book containing seventy-three prints from my negatives, two of which are printed by the Wothlytype and seventy-one by the ordinary silver process.

Immediately on the establishment of the Wothlytype Company—I think in 1865—I obtained emulsion, paper, &c., &c., printing with these materials, and was perfectly delighted with the beauty and perfection of the results obtained. Truly I can use Colonel Stuart Wortley's words, and say they were the most artistic photographs I had ever seen. I hope you will have time to look at the pictures, and will report upon the merits of the processes of printing employed. I must assure you that all the pictures were printed at the same time.

I have always felt that the failure of the Wothlytype Company was a great misfortune to the progress of photography, and have hoped that the process might have been revived, especially as Herr Wothly, the inventor of the process, called on me but a few months before his untimely death, and assured me, in answer to observations I made, that all the uncertainty of production had been removed, and that he would undertake to print fifty sheets of paper per day without a failure. It was, therefore, with extreme regret I read Mr. Werge's unworthy and misleading *soubriquet* of "worthlesstype" applied to a process which, in capable hands, produces exquisitely beautiful results, and also permanent, as far as my experience goes.—I am, yours, &c.,

46, *Kensington Gardens-square, Westbourne Grove, W., June* 28, 1875. ROBERT FAULKNER.

[The above letter has just been received on our return from the north, the pictures spoken of having, in our absence, been returned. We shall be most happy, however, to see the pictures whenever Mr. Faulkner can make it convenient to call.—EDS.]

## WASHED EMULSION.

*To the* EDITORS.

GENTLEMEN,—Dr. Nicol, in THE BRITISH JOURNAL OF PHOTOGRAPHY of the 29th January last, and Colonel Stuart Wortley in your issue of the 18th instant, have both called attention to a method published by me in your Journal of making and washing a gelatine emulsion.

I have only to say that I gave it as a result of my experience with gelatine and bichromate of potash when I was employed at photo-lithography, along with Sergeant Spackman, R.E., at the South Kensington Museum. The separation of the bichromate salt from the gelatine, when set and immersed in water, was easily observed.

A trial with gelatine emulsion satisfied me that all the soluble salts it contained, after the bromide and silver salts were added and silver bromide formed in it, could be removed by washing.

I have prepared some very sensitive gelatine emulsion plates, and from experiments made I have been able to trace out a course of further experiments, by which I hope to be able to determine the conditions necessary to make the most sensitive collodion and gelatine emulsions.—I am, yours &c., J. JOHNSTON.

*Glasgow, June* 29, 1875.

## THE ROLLER SLIDE.

*To the* EDITORS.

GENTLEMEN,—All dry-process photographers are indebted to Mr. Warnerke for the perseverance and ingenuity shown by him in overcoming the difficulties pertaining to collodion on paper and to its transfer; but the credit of first introducing the roller slide must be awarded to Mr. A. J. Melhuish, who, as long ago as 1856, fully described and figured, in the *Journal of the Photographic Society* for April of that year, a piece of apparatus with which Mr. Warnerke's slide is almost absolutely identical.—I am, yours, &c., HISTORICUS.

*To the* EDITORS.

GENTLEMEN,—Allow me to offer a few suggestions in the hope of adding somewhat towards perfecting the apparatus of M. Leon Warnerke, which he generously describes in your last issue, and which seems to bid fair to eclipse all other modes of out-door photography.

I think that if the rollers were made to adapt themselves to the dark slide instead of being fixed it would give greater facilities to the operator, as by so doing any number could be prepared, and when one length was used up another could be substituted without tent or covering by letting a space of the supporting material—say a few inches larger than the size of the plate or picture—remain at each end of the length, so that it would completely protect the film from the light till ready for exposure.

The rollers might be made with a movable milled head fitting into a square socket at one end, the opposite extremity bearing a fixed axle, the tissue being kept strained by the extra wheel figured in your last number. By this means large rollers or extra thick slides are obviated and convenience increased, as they can be removed at pleasure and others fitted in their place, so that when out on a long journey the used ones can be developed in the evening or secured till some convenient time.—I am, yours, &c., A. D.

*June* 28, 1875.

## "RESIDENTS OF VITREOUS ESTABLISHMENTS," &c.

*To the* EDITORS.

GENTLEMEN,—In your issue of the 18th June I made objection to being treated as one who reasoned ill upon the strength of affirmations which I had not made, and expressed surprise that "of all men else" the charge should be preferred by the author of the statement which has been condemned. My friend Mr. Batho's manifesto does not touch upon the point. He rambles on to other ground, and makes the matter worse. He seriously misquotes me,* and then makes merry over what, again, is but an error of his own. He favours us with an "analysis" of my argument which is both uncalled for and unsound, and introduces much material foreign to the ground of my complaint. It is better to dismiss the thing at once than persevere with discussion which assumes this form. Nothing is easier done (or less worth doing) than to put an opponent in the shade if misstatement and misquotation be allowed, if irrelevance and discursiveness may be indulged in, and an author may alter the meaning of his bygone words to suit the present time.

Your other correspondent (he who says he will not write again) would act with greater wisdom if he never wrote at all. It may be weak to quarrel with one's critics; but advice to that effect comes ill from one who has quarrelled more, and with greater acrimony and less ground, than any other writer in these columns. In 1871 he wrote two whole columns of good round abuse,† in answer to remarks of mine which occupied *six lines.*‡ He also quarrelled with the Editors themselves for not heeding his request to refuse admission to any further matter from my pen,§ and since that time has "run amuck" of many worthy men and true.—I am, yours, &c., D. WINSTANLEY.

[The latter part of Mr. Winstanley's letter is a mistake. He has evidently made up his mind that a certain gentleman has an *animus* against him and has ventilated it. We can assure Mr. Winstanley that his mental ingenuity has in this case entirely misled him. The controversy being of an entirely personal nature, possessing no interest for our general readers, we must decline to publish any further communications on this subject, feeling assured, at the same time, that we are doing no wrong to Mr. Winstanley or anybody else in now closing the discussion.—EDS.]

ANNUAIRE DU JOURNAL DE PHOTOGRAPHIE FOR 1875.—This work, edited by M. G. Huberson, is now in the press, and will be published on the 1st proximo. We are requested to intimate that advertisements will positively not be received later than Thursday, the 15th inst. Any received after that date will be inserted in *du Annuaire* for 1876, which will be published early next January.

"LAMBERTYPE" AND "CHROMOTYPE."—For the convenience of those of our readers who may wish to inspect specimens of these two processes, we beg to inform them that such specimens may be seen in London at the editorial office of this Journal, 2, York-street, Covent Garden, W.C., or in Liverpool at the commercial department, 32, Castle-street, at either of which places those interested are invited to call.

## EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at the small cost of one shilling in our advertising pages. This column is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

I require a 12 × 10 or 10 × 8 group lens, in exchange for two handsome cases of foreign birds.—Address, GASSON, Winchester.

Rectangular prism (mounted) for reversing negatives, in exchange for lens, either doublet, triplet, or rectilinear, half-plate or larger.—Address, J. M. TURNBULL, 14, Nicholson-square, Edinburgh.

A whole-plate lens by Colas, in very good condition, arranged to take views 12 × 10 and under, will be exchanged for a *carte* lens by a good maker.—Address, B. BENNETT, Fair-street, Drogheda.

Wanted a good 8½ × 6½ view lens, or pair of six-inch stereos in exchange for a medical coil and battery in working order, with handles, &c., in mahogany box about six inches square.—Address, H. S., 97, Manchester-road, Swinton, near Manchester.

A dark tent on three wheels for plates 12 × 10, complete and quite equal to new, and a Voigtlander portrait lens, cost £8 2s. 6d., equal to new, will be exchanged for a No. 2B patent Dallmeyer, which must be in condition equal to new, or offers.—Address, W. DAKIN, Poplar House, Nether Edge, Sheffield.

A new first-class portable developing box, on wheels, with every convenience, worth £15 (photo. sent), will be given in exchange for either of the following:—Ross's No. 2 universal lens, Ross's No. 3 *carte* lens, or No. 3 cabinet; Dallmeyer's No. 2B *carte* lens, or ditto No. 3D group lens.—Address, S. ARLIDGE, photographer, Weedon.

* Mr. Batho speaks of me as disposing of some one's argument by saying the "notion is ungrounded and unworthy of being entertained." What I said was this (see page 236):—"The pursuit of science does not demand the controversion of ungrounded notions, for they are unworthy to be entertained."

† P. 326. ‡ P. 313. § P. 331.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

EDINA.—No; thanks—not at present, at any rate.

WILLIAM ROWE (Leicester).—Received; will be attended to.

S. ARLIDGE (Weedon).—Certainly, you *would* infringe the patent.

REV. B. J.—There must be some misunderstanding; only one was received.

B. (Queenstown).—The price of the *Manual* is one shilling. It may be procured through any bookseller in your district.

B. L. (Leeds).—Each different size will require separate registration, as will also the various poses. The amount to be remitted for registration is fifteen-pence for each picture.

PHILO.—By rinsing the vessel first with water and then with hydrochloric acid the whole of the impurities will be removed. Of course it must receive a final rinsing with pure water.

H. C. COGSWELL.—Your difficulty points to the employment of a bad sample of pyrogallic acid. Try a fresh batch. Or it may arise from the use of too great a quantity of restraining acid.

JAMES I. F.—Adopt the wet collodion process, and complete the negative before leaving the spot. There are numerous occasions when dry plates would be more convenient; but in this special case wet plates will be preferable.

GEO. B. COOKE.—Try a concave spectacle glass of the (negative) focus of five or six inches. We have long used such a glass for a view meter, and find it very convenient. It must, of course, be mounted in a very short tube capable of adjustment.

S. B. HOLMES.—In copying a *carte* the texture of the paper will be rendered almost invisible in the negative by causing the light to fall upon it from all sides, using, in short, a very diffused light. The texture of the paper is shown in its most offensive manner when the *carte* is illuminated by a strong side light.

A NEW SUBSCRIBER inquires—"What kind of lens is best adapted for copying?" We reply: any lens is adapted for this purpose that gives freedom from distortion, and produces a picture of uniform sharpness. There are now so many lenses which fulfil these conditions that it would be invidious to indicate any in particular.

T. M. H.—The microscopic enlargements you enclose are certainly very good. The colour of such objects is generally so non-actinic as to preclude the possibility of obtaining the finer details with any exposure without sacrificing the rest of the picture. The difficulty in focussing would be obviated by the use of a more powerful light.

MESSRS. W. A. MANSELL & CO. (2, Percy-street, W.) have forwarded to us a copy of their new catalogue of landscape and other photographs, and also a selection of pictures. The latter we have not yet had an opportunity of examining; but hope to do so in a day or two, and to record our opinion on their artistic merits in our next.

"SMASHEM."—1. The shellac varnish may be obtained at any oil and colourman's. Do not use French polish, as that frequently contains oil in addition to shellac.—2. The wooden bath is to be heated thoroughly and the melted wax poured on and allowed to remain a few minutes. The surplus is then poured out. You will find full directions given in the volume of this Journal for 1873, page 420.

W. J. STILLMAN.—We have received a lengthy communication from Mr. Stillman in reply to Mr. M. Carey Lea. While desirous, to the best of our ability, of giving every opportunity for fair discussion, we must object, in the interests of our readers, to the occupation of our space in merely personal controversy. Mr. Stillman brings forward no new arguments, and, both sides having been fairly heard, we think the matter may now be safely allowed to rest.

KNOW NOTHING.—1. In asking us to recommend you the best dry process to use you desire to set us a task we are unable to accomplish. If you cannot form your own judgment from what has appeared in our columns, we fear that we cannot assist you.—2. The mixture of twelve ounces of albumen with two drachms of water which you speak of must be a mistake. Give us further details and we may be able to advise you.

H. W. D. (Ryde).—1. It is necessary to reverse the lens when so employed.—2. If the back and front combinations of the lens be not reversible the best plan would be to cut away the woodwork of the front so that the lens might be screwed into the flange from the back—that is, from the interior of the cone. If the latter be not sufficiently large to permit this there will be no resource but to abolish it.—3. The simplest form of shutter consists of a roller of wood passing through the camera from side to side, and furnished with a wooden or other knob for the purpose of turning it. A sheet of blackened zinc or cardboard attached to the roller will form a convenient and simple shutter. If the lens employed be of very short focus it may be necessary to divide the shutter in the centre, working it with two rollers at the top and bottom.

A LITTLE PHOTOGRAPHER (Fulham).—We have received a communication under the above signature, from a well-known contributor to our columns, on the subject of the recent controversy between Messrs. M. Carey Lea and Stillman. As we have elsewhere expressed an opinion that the discussion has been carried far enough, we think it unnecessary to give more than an extract or two from our friend's letter. He says:—"I am, in my small way, a believer in Mr. M. Carey Lea's abilities as an experimentalist, and might add that this faith is supported by another belief—that Mr. Lea is conscientious in publishing what he has found to result from his experiments without having any commercial motive to mislead." * * "In writing this letter I am, I know, only expressing the opinions of dozens of my photographic acquaintances when I say that Mr. Lea deserves more kindly expressions than Mr. Stillman has chosen to bestow upon him."

SEDAN.—There are many subjects upon which we would not feel justified in giving full information, involving, as they might, trade and private interests. Of this character both of your queries partake. In reply to the first, we advise you to obtain the required information through a trade protection society; while to the other we may say that we do not consider the time has yet arrived for us to publish all that we know in connection with such a branch of manufacture.

LL.D.—Our correspondent has been made aware of the advantage resulting from an addition of nitro-gelatine to the negative developer, but is somewhat uncertain as to the best method of preparing it. He asks if it be not a simple solution of gelatine in nitric acid. He is correct. The best or, at any rate, one of the best preparations of nitro-gelatine for adding to the negative developer consists—not in dissolving the gelatine in nitric acid in its pure state, but when diluted with water in the proportion of four parts (drachms or ounces) of the acid to twelve parts of water, about three parts of gelatine being a suitable proportion to dissolve in this quantity. Only a small quantity of this must be added to the developer.

A BRADFORD PHOTOGRAPHER writes to us respecting M. Lambert's method of retouching recently described in this Journal. He has for five years been in the habit of adopting a process of a somewhat similar description to that of M. Lambert, and he demurs at now being compelled to discontinue such practice simply because another has come forward to patent it. Our correspondent, who sends us a detailed account of his method of proceeding, need not entertain the slightest fear either as to infringing any patent or of being compelled to discontinue his practice; for the essential feature in M. Lambert's process is the affixing of a sheet of paper to *both* sides of the negative, whereas "A Bradford Photographer" attaches it to one side only. We have also been asked by others if an article by Mr. Werge in our ALMANAC for 1869—in which that gentleman gave minute directions for attaching paper to negatives for the express purpose of enabling retouching to be effected, and also for imparting softness and texture to prints from hard negatives—has not anticipated the more recent French invention. To this we reply that, while Mr. Werge's method is doubtless very excellent and very simple, only one sheet of paper is used, or if more be employed they are placed in *front* of the negative; whereas, as we have already stated, the patented method provides for a paper mask being placed behind as well as in front of the negative.

**☞ Editorial Communications should be addressed to "THE EDITORS"—Advertisements and Business Letters to "THE PUBLISHER"—at the Offices, 2, York-street, Covent Garden, London, W.C.**

THE NEW POSTAL ARRANGEMENTS.—In accordance with the provisions of an International Treaty concluded at Berne on the 9th October last, the whole of the states of Europe, the United States of America, and Egypt have formed themselves into a general postal union for the reciprocal exchange of correspondence, and have agreed to adopt low and uniform rates of postage for all correspondence despatched from one state of the union to another. As a general measure these provisions, which extend to letters, post-cards, newspapers, and other printed papers, patterns of merchandise, and legal commercial documents, will take effect on the 1st July, but in the case of France not until the 1st of January, 1876. All correspondence addressed to France will continue subject to the existing rates of postage, and it will be necessary in some cases to levy temporary higher rates than the union rates on the letters, &c., forwarded by the route of France to other states of the union; but such letters, &c., will be forwarded through France only in those cases where a rate of postage for the transmission by that route is given in the table issued by the postal authorities. Under the term "printed papers" are comprehended stitched or bound books, pamphlets, music, visiting cards, circulars, catalogues, prospectuses, announcements and notices of various kinds, whether printed, engraved, or lithographed, as well as photographs. Printed papers must, as a rule, contain no writing, manuscript figure or mark whatever, beyond a simple stroke marking a particular passage of the text to which it is desired to call attention.

OUR METEOROLOGICAL TABLE.—Owing to an oversight in our Publishing Office the last two weeks' reports have been mislaid. We are consequently compelled to hold over this week's report until we can procure duplicates of those mislaid, when the consecutive publication will be resumed.

## MEETINGS OF SOCIETIES FOR NEXT WEEK.

| Date of Meeting. | Name of Society. | Place of Meeting. |
|---|---|---|
| July 5 ........ | West Riding of York. Pho. Soc. | Victoria Hotel, Bradford. |
| „ 7 ........ | Edinburg Photograpnic Society. | 5, St. Andrew-square. |

## CONTENTS.

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 792. Vol. XXII.—JULY 9, 1875.

## ALKALINE DEVELOPERS.

The development of dry plates has undergone during the last ten or twelve years a complete revolution, and at the present day alkaline development appears to have quite displaced all others. Notwithstanding, however, the very general employment of that method at present, very little alteration has been made in the formulæ of today as compared with those of ten years ago.

The only variation in practice that we can speak of is the use of a strong instead of a weak developer; but this, though undoubtedly of value under some circumstances and with certain descriptions of plates, is worse than useless in other cases. A strongly-alkaline developer will always, under any circumstances, bring out a more vigorous image upon the first application than a weaker solution; but, unfortunately, the stronger images so produced are less amenable to the subsequent action of alkaline pyro. than the delicate impressions brought out by the weaker developer, and generally require the application of silver in order to produce printing density. In addition to this, the employment, in the first stage of the development, of a strong ammoniacal solution will in many instances produce an image of such a character that, although the whole of the silver throughout the thickness of the film may be reduced, the deposit is thin and transparent, and no after-treatment will render it of any printing value. A similar result is also frequently obtained in connection with the most sensitive bromide plates, but in that case neither silver nor any other form of intensification proves of avail.

This unsatisfactory result, no doubt, is often traceable to the solvent effect which ammonia possesses for bromide of silver, to remedy which defect it has been recommended—by Major Russell, we believe—to saturate the ammonia with silver bromide previous to its employment for developing purposes. This treatment, however, appears only to weaken the developing power of the ammonia.

In virtue of its non-solvent action on silver bromide the carbonate of ammonia possesses an advantage over the liquor if used with judgment; but it also has its disadvantages, which consist in its uncertain nature both before and after solution, and the difficulty experienced in making a sufficiently-strong solution at a short notice, in case it is preferred to use it fresh instead of keeping it in solution. Its alkaline reaction is not nearly so great as the liquid ammonia, and hence its developing power is inferior. The salt, which is really a sesqui-carbonate (that is, consists of three equivalents of ammonia to two of carbonic acid), when exposed to the atmosphere gives off ammoniacal fumes, leaving in time a residue containing one equivalent each of carbonic acid and ammonia (commonly known as the "bicarbonate"), and which possesses a greatly inferior developing action.

Hitherto these two substances have been the only ones employed for developing purposes, though other alkalies have been mentioned but not generally brought into use. This is scarcely to be wondered at if we consider that over ten years ago Major Russell investigated the action of various alkalies and alkaline carbonates, and arrived at the conclusion that the carbonate of ammonia offered the greatest advantages. That salt or the *liquid* ammonia has since been proved to produce the best results with plain bromide plates; but now that both chloride and iodide of silver are employed in dry-plate emulsions the question arises as to whether we cannot, under the altered circumstances of the case, discover a better form of developer than that now in use.

Of the three haloids the bromide occupies the midway position as regards its affinity for silver, the iodide and chloride possessing respectively a greater and a less affinity. It would follow from this that the chloride would be more easily reduced by an alkaline developer than the bromide, the reverse being the case with iodide—a state of matters fully borne out by the facts. While a chloride of silver film is reduced with ease though not exposed to the light, a film of iodide was, until last year, supposed to be totally unaffected by alkaline pyro. under any circumstances. Towards the latter part of last year, however, Mr. W. Robinson showed in our columns that by the employment of a much stronger alkaline solution iodide of silver is not only reducible but may be made to give films of great sensitiveness; while, on the other hand, the earlier attempts at the addition of a chloride to an emulsion failed in consequence of the invariable appearance of fog. Pursuing the line of investigation here indicated we have recently been engaged on the examination and comparison of various substances, and propose to give a brief account of our results.

We remember hearing a complaint made some years ago to the effect that plates prepared by a certain formula refused to intensify by means of alkaline pyro., while the results obtained upon slightly different plates were eminently satisfactory. A well-known dry-plate worker to whom the complaint had been made expressed an opinion that any dry plate ever prepared could be intensified by the alkaline method subject to certain variations. This opinion we did not at the time share, though we are now inclined to believe in its truth; but, independently altogether of that point, we have no doubt that many spoilt negatives and many complaints arise solely from the imperfect knowledge of the use of alkali possessed by some at the present day.

Almost every different preservative, variation in exposure, and many other circumstances combine to render necessary a variation in the development of different plates—slight, perhaps, but still sufficiently a variation to show that a blind adherence to any written formula is simply impossible if the best results be desired. In order to derive the fullest range of benefit from the alkaline method we think that one or two additional substances may be introduced into the list of those already employed.

In our experiments we have, of course, taken as our basis of comparison liquid ammonia and the carbonate. The latter we prefer to use, as it offers a much greater range of power; in comparing the action of the two we have used a mixture of one part of liquor ammonia fort. (s. g. ·880) to seven parts of water and an eighty-grain solution of carbonate of ammonia. Of the former we have found it unsafe to add more than two or, at the most, three drops at one time for each drachm of solution; while, if necessary, the latter solution may be used of the full strength without ill effect. In the case of the carbonate, the effect of the alkali may be carried to a much further extent than is admissible in using the *liquor*, without fear of bringing into action any solvent power it may possess from

the presence of free ammonia, while the powerful solvent action of the liquid ammonia confines its use within very limited bounds. This matters little in the earlier stage of bringing out the image, but is of great importance in the intensification.

We have never yet met with any plates which will produce full intensity on the first application of the alkali and pyro.; but there is a great variation in the *extent* to which it is necessary to carry the first development with different plates. Some descriptions require that the image should be developed immediately to a comparatively vigorous appearance, while others merely require the details brought out very faintly. In the former case it is of course necessary to use a strong developer; but the images so produced are more difficult to intensify subsequently. The delicate images produced by the weaker developer intensify with the greatest readiness under a further application of a stronger solution, provided the character of the plate is such as to allow of a weak development in the first instance.

It has of late years become the fashion to intensify by the addition of more alkali and restraining bromide to the first quantity of pyro. solution used, and hence arise, we believe, many of the failures in getting sufficient strength. If, after bringing out the details, the plate be washed and a fresh solution applied, with an increased quantity of alkali, the strengthening effect produced is infinitely greater; and if not then sufficient, successive additions of alkali *and pyro.* will produce any required depth of deposit. The contrast between the alkalinity of the first and subsequent applications appears to produce greater effect than the absolute quantity of ammonia present. This rule we have found to hold good with the whole of the substances we have tried.

Amongst those substances the most satisfactory results have been obtained by the use of soda and potash, both in the state of hydrate and carbonate; in addition we have tried the bicarbonates and also borax. The great advantage of the hydrates of soda and potash lies in their solubility in water and the absence of solvent effect upon the film. These, when properly restrained, enable us to use a most powerfully-alkaline solution for intensifying, without fear of producing that transparency of the deposit which is so obnoxious.

The carbonates of soda and potash come next in the order mentioned. Their effect is more powerful but less easily restrained than is the case with the ammonia salts. The bicarbonates, more especially that of soda, are not sufficiently soluble to give them any special advantage over ammonia, while the unmanageable effect spoken of above is equally strong. The borax is deficient both in solubility and in alkalinity, and is inferior to any of the rest. The strength of the solution we have used was, in the case of the caustic alkalies and carbonate of potash, sixty grains to the ounce, while the rest were saturated solutions.

The result of the trials we have made, roughly so far, is to induce us to believe that a variety of results may be produced by the use, when required and under peculiar circumstances, of other solutions besides those previously employed, and we hope ere long to have our experiments so far placed in shape as to be able to classify the results, and lay down some reliable rule as to the exact properties and value of each.

## OBSCURE CAUSES OF DEFECTIVE SHARPNESS.

While photographing a few days ago, in a high northern latitude, we focussed a particular view with microscopic sharpness with the intention of subsequently enlarging a portion of it. The subject itself was the mountainous island of Hoy, one of the Orkney group, as seen from the heights above Stromness; and in consequence of the poetic halo thrown round the "Dwarfie Stone" by Sir Walter Scott, in his *Pirate*, we were particularly desirous of delineating its surroundings with the greatest attainable sharpness, and for accomplishing which, we may observe, the optical means at our command afforded us every opportunity. Notwithstanding our care it so happens that this picture is one of the least sharp of all those taken during our recent "out." While it is true that to the unaided eye the particular negative in question seems quite sharp, it is not the less the fact that when examined by a powerful magnifier the details lack distinctness of outline.

With the cause of the defective sharpness in the case referred to we are quite well acquainted. Although at first, after developing the plate (a fortnight after exposure in the camera) we were inclined to attribute it to tremor of the camera, caused in some way or other by the wind, we have since become aware of the insufficiency of this reason, the morning being calm. We now, however, recollect that its origin is to be traced to a tremor of a different kind, namely, the tremor of the atmosphere caused by the warm beams of the sun acting on the surface of the earth, by which is produced a stratum of rarefied air which ascends, its place being supplied by a colder and more dense layer, which, as it becomes heated, also ascends. This motion of the air would not of itself produce any loss of sharpness in a distant object, whether examined visually or delineated photographically; but each alteration in temperature is attended with an alteration in the index of refraction, and hence, during the prevalence of thermal conditions such as we have indicated, sharpness is rendered impossible—a fact familiar to the schoolboy, who knows that when he looks along a heated bar of iron at any object the latter immediately ceases to be plainly seen. In applied optics the more perfect the instrument is through which an observation is made the more is it affected by atmospheric perturbations.

Photographers are sometimes inclined to blame the optician or camera-maker for imperfect workmanship when, after focussing a landscape sharply, they find that the resulting picture is defective in this respect, the real cause of the deficiency arising from the vibrations of the atmosphere. Let us assume that a distant scene is about to be photographed, and for some particular reason it is required to possess much more than ordinary artistic sharpness: it will be well for the artist to examine carefully, by means of a pocket telescope—without which no one should go to any considerable distance from home—the scene to be depicted; for if visually sharp, then the presumption is that it will be sharp when photographed; but if it be seen "dancing before the eye" when under telescopic examination, all hope of securing an intense degree of sharpness in the photograph may at once be abandoned.

In the foregoing we have hinted at one obscure cause of defective sharpness. There is another. Of course we are assuming all this time that apparatus of the most perfect kind are being employed, and we continue the assumption.

During even a mild breeze there is a tremor in the camera which, be it ever so slight, impairs the sharpness. This is especially the case when the camera-stand is of a slender and over-portable kind, and inadequate for the steady support of a camera. In our volume for 1866, in an article headed *How to Photograph in a Gale*, we directed attention in a somewhat pointed manner to the nature of, and remedy for, vibration in the camera arising from this cause. Just previous to commencing this article we have happily placed ourselves in a position to speak with absolute certainty concerning what we believe to be by far the most effective way by which to obviate this evil.

The experiment we are about to describe was made with a somewhat heavy $7\frac{1}{2} \times 5$ camera erected on a "Price's" camera-stand—a stand which, for elegance of design and general convenience, cannot be surpassed. A view having been focussed with great care a plate was exposed. Now, although there was an apparent breeze at the time, it was sufficiently moderate to render it unnecessary, in our estimation, to adopt any precautions to ensure absolute stability beyond that so well known to landscapists of interposing their own person between the wind and the camera, with the superadded precaution of holding the flaps of the coat quite extended. Watching the camera intently we found no observable vibration. Another plate, prepared in a manner similar to the former one, was next exposed for precisely the same period, but with this difference—a long piece of stout twine which had been fastened to the screw at the top of the camera-stand was brought under our right foot, which we placed on the ground directly under the camera, and just before uncapping the lens we pulled the string quite tight, and held it firmly, while thus tightened, by the means above indicated. The plate was then exposed, no precaution whatever having been taken to shield the camera from the wind. When both pictures were

developed the latter showed a most decided advantage over the former as respects sharpness. Although the former was sufficiently sharp to produce a print upon paper without anything wrong being noticed, the details of the negative, when examined by the aid of a magnifying glass, were, in a merely optical point of view, decidedly "fuzzy;" but that which was obtained by the steadying aid of the piece of string used in the manner described, was so sharp as to bear, if necessary, being enlarged to several diameters.

Many photographers are aware of the simple expedient here indicated; but to some members of the fraternity it has hitherto been unknown, as we gathered from their remarks when examining at our office the two negatives to which reference has just been made.

Arising out of the incident described, we would suggest, as a most useful addition to the *impedimenta* of the photographic tourist, the attaching of a piece of string to the screw of the camera-head, and to the lower end of which string should be affixed a light, pointed metallic stake which can be pushed into the ground below the camera, and equidistant from the legs of the stand. The string should run loosely through a hole in the stake so as to be capable of being pulled tight and pinched. This will only be found necessary when too light a stand is used; but unfortunately many of the stands prepared for tourists are very light. Such a stand, however, can be rendered as effectively rigid as a much heavier one by the addition of the central string to which we have alluded; and, although when recently photographing scenes far distant from home we more than once thought our "Price's" stand too light, we have eventually arrived at the conclusion that were the same journey to be again undertaken under similar circumstances we should select the same stand in preference to several others in our possession. A professional photographer who visits any particular spot for the sole purpose of securing negatives of the desired views should consider it imperative to take with him a stand which, by reason of its strength and rigidity, would remain unswayed during even a hurricane, and, at the same time, be of sufficient height to overlook all minor obstructing obstacles in the foreground; but between a photographer with such high purposes in view and one whose only aim is to secure a few mementoes of a journey, we here make a becoming distinction.

## UTILISING OLD EMULSIONS.

We have on more than one occasion stated that, at least for landscape photography, the process of the future is likely to be an emulsion process; nor do we think we are probably far wrong in saying that the time is not far distant when it must supersede wet collodion for even the ordinary work of the studio. It is on record as the experience of some of our ablest experimentalists that, under certain conditions, a dried film containing bromide of silver, or mixtures of that in conjunction with an iodide and a chloride, may be as sensitive to light as the most rapid bromo-iodide film prepared in the bath and used while still moist without washing, containing, in consequence, nitrate of silver largely in excess. Of course those whose experience has been mainly confined to the good old system have some difficulty in realising this fact, especially when they read of the very long exposures sometimes given to certain varieties of dry plates; but there is really no *a priori* reason why what has been occasionally done should not, the necessary conditions being thoroughly understood, be easily done again, and become, not the exception, but the rule in ordinary practice.

There can be no doubt that the ordinary work of the studio would be immensely facilitated if it were possible to take advantage of a dull day, or of the slacker hours of the early morning, in which to prepare a sufficient number of plates for the requirements of a week; and we need little aid from prophetic seers in stating that the accomplishment of this desideratum is simply a question of time. To bring about this desirable result, however, it is imperative that the united efforts of all possessing the requisite ability, leisure, and convenience should be directed to the kind of experimental work here demanded, and that the outcome of the observations so made should be freely communicated and frankly received.

By saying that the outcome of such observations should be frankly received, we do not mean to convey the idea that they should be taken for more than they are worth, but intend rather to hint that there exists in the minds of some of our friends a slight shade too much of desire to carp and find fault with anything they cannot very clearly understand, or with results that they may fail to reproduce. Of course, when any statement is made that can be proved to be untrue, or where an unwarranted inference is deduced from any series of results, it is desirable that the mistake should be corrected; but even in doing that either a right or a wrong way may be adopted. It will generally be found that there is something to be learned from such a record, although the inferences of the experimentalist may not be altogether correct. In fact, we are inclined to believe that in many cases quite as much information may be got from the failures of an operator as from his successes.

All who have experimented much with emulsions know how rapidly *matériel* accumulates on their hands; and although a few ounces may not represent in value a serious sum in the current coin of the realm, yet when it amounts to pints it requires little calculation to show that that means half-guineas. Further: as the recovery of the silver is a somewhat troublesome operation, any means by which the apparently useless emulsion may be turned to good account must possess considerable importance.

With a view to show how we utilised a somewhat large quantity, we proceed to record a few experiments we have recently made; and, although we do not desire it to be taken for granted that the method we adopted is the best, we feel satisfied that the production of between three and four ounces of dried pellicle—sufficient to form nearly three pints of most excellent working emulsion—from three pints of what may be called "emulsion refuse," some of which was at least four years old, and all of which had been more or less exposed to light and was thoroughly useless, is a fact worth recording.

Having, as we have already said, a high appreciation of the capabilities of the emulsion system, we have more or less been in constant work with it since the period of its introduction by Messrs. Sayce and Bolton. The quantity on which we usually operated was two ounces, having some four-ounce bottles of dark green glass which we found very convenient for that quantity. From each batch of emulsion there were generally only a few plates coated, so that we may safely say that, on the whole, less than half of what was made was actually used, the rest being set aside for future experiment, and either forgotton or, as we never like to throw anything away, poured into a Winchester quart when the smaller bottles were required for other experiments. In this way we had accumulated some six or eight Winchester quarts of a mixture made up of all kinds of emulsion, coloured with most of the aniline dyes, and containing uranium, catechu, morphia, and half the articles of the *materia medica* besides.

One of these Winchesters, about three-fourths full, was selected for our experiments. A small portion of the contents having been placed in a test tube was boiled with a quantity of distilled water for a few minutes and then poured on a filter. While the solution was passing through the filter we coated a plate with the emulsion, exposed it to sunlight for some time, and found that, although the action was not rapid, it yet darkened considerably. Another plate was coated, immersed in a solution of tannin, and exposed in the camera; but, on the application of the developer—although it contained a considerable quantity of a bromide—it was instantly fogged all over. The same result was obtained on a plate which was coated and had the developing solution applied without exposure. The solution having by this time passed through the filter was tested for silver, but with a negative result; and on being tested for a bromide only a very slight indication of one was found. Recollecting that it had been frequently shown that ordinary dry plates exposed to light might have the latent image destroyed by immersion in dilute nitric acid and again made sensitive by the application of a solution of tannin, we thought that the effect of exposure to light, to which our emulsion had been frequently subjected, might be destroyed by the addition of nitro-hydrochloric acid, and therefore added three drops of it to each ounce. A plate was then prepared

and exposed in the camera for three minutes with an $\frac{f}{10}$ stop; but the developer failed to produce an image, although there was no trace of fogging. We next added sufficient silver dissolved in alcohol to give two free grains in each ounce, and on preparing and exposing a plate for only one minute got an over-exposed negative. A second experiment, with only thirty seconds' exposure, developed perfectly clean and full of detail, but refused to take on sufficient printing density, although it gave no trace of fog with even very large quantities of ammonia and merely a trace of bromide. This difficulty in obtaining density we believed might be overcome by the addition of tannin, and were much pleased to find that it succeeded beyond our expectations. To each ounce of the emulsion we added twenty drops of a thirty-grain alcoholic solution of tannin; and although on attempting to coat a plate, after what we thought sufficient shaking, it appeared as if covered with dark specks, these disappeared with prolonged agitation. A plate coated, simply washed in water, and dried gave with an exposure of twenty seconds a first-rate negative, full of brilliant detail and perfectly dense, with the first application of the developer.

Being satisfied that we had now got the emulsion into good working order, but doubtful as to its keeping qualities, we resolved to transform it into a pellicle, and therefore proceeded to pour it out on several pieces of plate glass, each 18 × 22, which were simply levelled and coated as thick as the emulsion would lie. This we think a better plan than that of pouring it into dishes, as the film sets sufficiently in a few minutes, and if thoroughly broken up with a silver fork is much easier washed than when it is thicker. The washing was carried on in a percolater such as is used by chemists in the preparation of tinctures, &c., and which is simply a cylinder of glass about eighteen inches long and four inches in diameter, with a flange of glass a few inches from one end, on which it rests while the operation is going on. The lower end of the percolater was plugged with a sponge, just tight enough to allow the water to flow at such a rate as we thought desirable; on this was placed the shreds of pellicle, and above it another sponge to keep back any sand or other solid matter which might be contained in the water. The apparatus thus packed was placed in position; but, as we had not sufficient leisure to watch the operation and fill up the percolator each time it became empty, we made it somewhat automatic by filling a two-gallon carboy with water and turning its mouth into the cylinder. In this way the washing went on without any further attention, and at the end of six hours, when all the water had passed through, we failed to detect either nitrates, bromides, or tannin. To "make assurance doubly sure," however, we filled the carboy a second time, and when the water had all passed the pellicle was gently squeezed in a piece of muslin and spread out on plates to dry This we found the most tedious part of the process, as, although the temperature of the drying closet was steadily maintained at 50° C., the pellicle was not perfectly desiccated till the end of the third day.

At first we were somewhat surprised at the difficulty with which the dried pellicle dissolved in a mixture of equal parts of ether and alcohol. Shaking seemed to have little effect in bringing about solution; and it was not till it had stood for six hours, with an occasional shake, that a satisfactory emulsion was obtained. But we found that this period was much shortened if the pellicle was first soaked for two hours in the alcohol alone, as on the addition of the ether it then dissolves much more rapidly.

As we have already said, we do not give this as positively the best method of utilising an old and useless emulsion, but we do know that in our hands it has answered the purpose admirably; and, as the whole operation is simple, we doubt not that all who have an accumulation of such *matériel* will, on trial, find the method equally successful.

## RIVAL PRINT BURNISHERS.

If our readers are unaware of the fact of there being more than one kind of American print burnisher it is not our fault, inasmuch as we have not ignored such fact. In our issue for May 14th we described certain improvements in the mechanism for burnishing prints patented in this country by Mr. J. P. Bass, who is the proprietor of the Weston patent, and, after giving such a description of the newly-patented invention as we could deduce from a close study of the patent itself, we made the following statement regarding the stationary *versus* the oscillating burnisher:—"We know that Mr. Bass at present looks upon 'Entrekin's oscillating enameller' with disfavour, and on the 30th of January last obtained from the Examiner of Patents a decision in his favour as against the claim of William G. Entrekin, the official document announcing this decision being now before us." We further said there was a great deal of "thunder in the air" as respects rival burnishers, and trusted that a friendly action would be instituted, so as to terminate the present state of uncertainty prevailing with regard to these competitive machines. As a consequence of that article we have been favoured with the following communication from Mr. Entrekin:—

"An editorial article which appeared on the 14th of May has had a tendency to injure me commercially, and has done so. You have placed yourself liable for damages, there being no truth in the statement. You will correct the mistake, and make the *amende honorable*, otherwise I shall have to take the steps, however disagreeable to myself, I think the situation demands. Enclosed you will find a pamphlet which will give you the true situation of affairs as regards the burnisher patents in the United States, of which I have the sole control."

Now it is not at all necessary that Mr. Entrekin should place himself in an antagonistic position towards us—a fact that he will readily appreciate when we inform him that the republication of a specification does not, in this country, render the publisher "liable for damages." If there be any libel contained, either in an open or concealed form, in the specification he must take proceedings against the Attorney-General, who examines and passes each patent. But if the "statement," to which allusion is above made, having reference to the announcement of Mr. Bass's intention of visiting this country and instituting proceedings against infringers of his patent be that in respect to which Mr. Entrekin says there is "no truth," that is a matter, we presume, which alone concerns Mr. Entrekin himself and Mr. Bass, and is one in which we cannot be supposed to take any interest.

We have spoken and written very highly of the Weston-Bass burnisher, for we tried it and found it a most excellent appliance. Mr. Entrekin's enameller, for aught we know, may be much superior to that of Mr. Weston, and we have heard it well spoken of; but *we* cannot give any opinion as to its merits or demerits, for the simple reason that we know nothing about it, never having seen or tried the Entrekin burnisher. Of one thing, however, we are aware: photographers in this country are eager to possess the best instrument for imparting a fine surface to their prints; and no matter by what name it is known, and irrespective of the patent under which it may be produced, *they will have the instrument which best suits their requirements* without reference to price or other considerations.

We have no reason to doubt that the special features of the Entrekin enameller are meritorious. They are not at present under review, and we are not in a position to offer any opinion respecting them; but, inasmuch as some degree of uncertanty prevails in the public mind respecting the legal right to use the rival burnishers, we must again reiterate our hope that by a friendly action, if not, preferably, by a friendly arrangement, all difficulties and doubts on this point will be solved, and that ere long. It would assuredly be for the advantage of the holders of both patents that such an arrangement should be speedily completed.

A word in conclusion: should we find in either English or American patents any novelty likely to interest our readers we shall certainly, as in the present instance, keep them *au courant* with what is going on, even though it be at the risk of our receiving letters of the somewhat hostile character of Mr. Entrekin's here printed, but which, having been written with an imperfect knowledge of the facts, we do not accept in an unfriendly spirit.

We have reason to believe that the Rejlander Memorial Fund will shortly be closed. Several of our friends having, shortly

after the inauguration of the fund, expressed an intention of contributing to this benevolent object, we would now take the opportunity of reminding them that the list cannot much longer remain open. The Treasurer will be glad to receive at the earliest moment the contributions of all who desire to aid in this praiseworthy movement. The purpose for which the fund was originally started—namely, to clear off a few liabilities left by the late Mr. Rejlander, and to make some provision for the bereaved widow—cannot yet be said to have been fully accomplished. We again strongly commend this beneficent object to the hearty sympathy of our readers. Photographic *art* is much indebted to the late Mr. O. G. Rejlander, who, in his lifetime, was not only its high-priest, but was himself the most unselfish of men—a generous friend to brother artists and to all who needed his aid and sympathy.

## EQUIVALENT OF *AQUA REGIA*.

The result of the examination by the Editors and by Mr. H. Cooper as to the quantity of nitrate of silver required to exactly decompose the halogens in my recent formula afford a quite sufficient confirmation of what I have myself stated. The infinitesimal differences are destitute of all practical importance, and would be so if they were many times greater than they are.

It is, therefore, purely as a theoretical matter that I remark that the difference between the amount obtained by the Editors and by myself as the equivalent in nitrate of silver of *aqua regia* is very easily explained. The Editors found that two drops of *aqua regia* decomposed 1·75 grains of nitrate of silver. I fixed the amount at 1·38.

1. The Editors used a specimen of hydrochloric acid a little stronger than the ordinary commercial acid, viz., specific gravity 1·18 instead of 1·16—the common strength. (See Watts' *Dictionary*, article, "Hydrochloric Acid.")

2. The Editors made their *aqua regia* by adding to nitric acid twice its *weight* of hydrochloric. I have invariably added to the nitric acid twice its *volume*. As nitric acid has a higher specific gravity than hydrochloric (that used by the Editors is stated to have been 1·45), it follows that their *aqua regia* contained a larger proportion of chlorine.

There is no difficulty in determining by calculation exactly what these differences of method amount to.

If we modify the figures of the Editors by supposing the acids to be mixed by volumes instead of by weights (using the same acids) the resulting *aqua regia* will decompose, for each two drops, 1·63 grains of nitrate of silver, instead of 1·75, as actually found by the Editors, using weights and not volumes.

If we again modify this by supposing hydrochloric acid of 1·16 used instead of 1·18 to be used, we shall substitute an acid containing 32·232 per cent. H Cl for one containing 36·333 per cent. (Ure, quoted in Storer's *Dictionary of Solubilities*.) And the resulting *aqua regia* will decompose 1·44 grains of nitrate of silver to each two drops.

In this way the difference of result is completely and satisfactorily explained. The amount obtained by the Editors, if modified to correspond with *aqua regia* mixed by volumes and with hydrochloric acid of ordinary strength, comes within $\frac{6}{100}$ of a grain of that found by myself.

As already said, in a practical point of view it matters nothing whether *aqua regia* decomposing 1·75 grain or 1·38 grain be used, but it is of interest to trace out the causes of difference of results.

M. Carey Lea.

## THE PHOTO-RELIEVO PROCESS.

No. II.

### Bichromatising the Hydrated Gelatine.

*Formula.**

| | |
|---|---|
| Solid hydrated gelatine | 5 ounces. |
| Bichromate of ammonia | 75 grains. |
| Prussian blue | *Quant. suff.* |
| Water | *Quant. suff.* |

The bichromate of ammonia is weighed out in the above proportion and dissolved in the smallest possible quantity of warm water. The Prussian blue (added to enable the operator to see his work during development) is next intimately mixed with the bichromate solution, which is then added to the melted gelatine. The whole must be thoroughly mixed and strained through flannel or muslin, as before, when it is quite ready for use. It is frequently desirable in very dry weather to add a little lump sugar to the gelatine solution to prevent the film splitting off on drying.

* For another means of preparing perfectly clear gelatine see the *Illustrated Photographer*, October 8, 1869, p. 462.

### The Preparation of the Film.

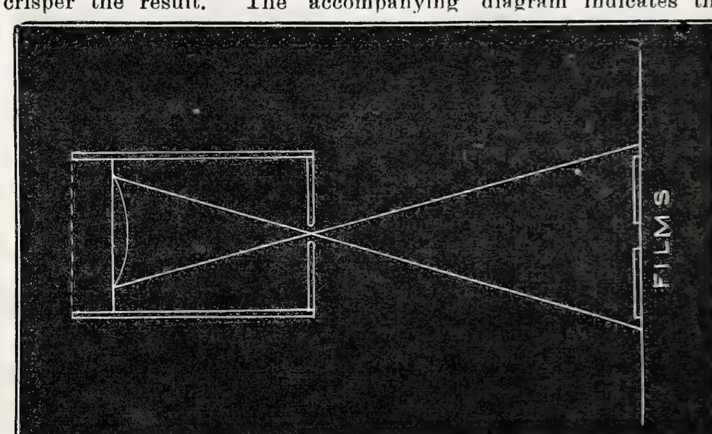
Select several pieces of talc perfectly uniform in thickness and of the required size, and by wetting affix them to a large sheet of glass. Squeeze out the superfluous moisture and polish the whole of the pieces. When talc of the required size cannot be procured wax a sheet of glass sufficiently large, and coat it with a film of strong collodion. Upon the talc or collodion side of the plate pour the coloured bichromated gelatine solution. Allow it to run all over and accumulate to the depth of one-sixteenth of an inch or thereabouts. This operation should be performed with the plate upon a levelling-stand, and, of course, in a subdued light. Minute bubbles in the film show that the solution has not been filtered with sufficient care. When a perfect film has been obtained it is allowed to set, and if not wanted for immediate use is preserved in the dark in an air-tight box. It cannot, however, be so preserved for many days.

The foregoing remarks are intended to apply to films which are to be exposed whilst wet. When the solar instrument is used they answer very well this way, but with the lime or electric lights the heat at any reasonable distance would melt wet films; and, moreover, the light being costly and of inferior intensity, it is desirable to obtain all the sensitivenes which can be got, and this, it has been found, exists much more in the case of films which have been dried. For the purpose of desiccation a chloride of calcium drying-box may with efficacy be employed. The plate containing the film is laid, face downwards, in a suitable carrier above a tray of fused calcuim chloride and kept at a moderate temperature. If so left all night, by morning the films will in general be found fit for use.

### The Exposure to Light.

With a sharp knife cut round the edges of the talc or collodion, and separate from the glass together with the sensitive film. Lay the talc (or collodion) side next the varnish of the negative; then a piece of filtering paper upon the gelatine and a board upon the filtering paper. The whole is next bound together with india-rubber bands and is ready for exposure. The diffused light of day, however, is altogether inadmissible in this process, it being an essential condition, as I have pointed out elsewhere,* that rays impinging on any portion of the negative must fall from one direction, otherwise definite penetration to any depth is quite impracticable.†

If the light of the sun is to be employed an ordinary solar camera with a condenser of about nine inches in diameter is a suitable instrument to use. No objective lens, however, is required. A diaphragm should be used at the focus of the rays. The smaller the hole therein the more constant will be the attention required and the crisper the result. The accompanying diagram indicates the




arrangement of the parts. It matters not, of course, whether a mirror be used to reflect the light in the solar instrument or whether the face of the condenser be continually directed to the sun. Cameras of both kinds are already in the market; the latter, however, is to be preferred from the greater ease with which clockwork may be applied to keep the light falling in the required direction.‡

* The British Journal of Photography, May 14, p. 234.

† Mr. Batho has remarked that I am to *some* extent right in my correction of his statement that parallel rays "are absolutely indispensable" for the production of reliefs. Surely if, as I have shown, parallel rays are *not* indispensable, I am *wholly* right in making correction of the affirmation that they are.

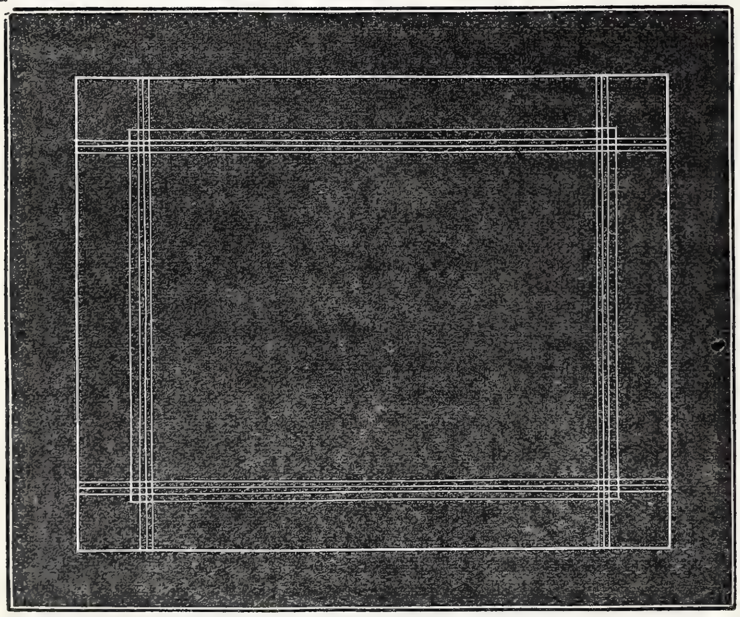
‡ See an article by the writer on automatic solar apparatus, in the *Illustrated Photographer*, October 9, 1868, page 429.

The distance at which the films may be exposed depends upon the temperature caused by the sun's rays, which should not exceed 75° Fah. at the place where the exposure is effected. Assuming the hydrated films to be employed, the exposure will last from one to two hours, according to the density of the negative employed. The films and negatives must not be disturbed whilst the exposure is going on; when completed it will be found that a faint image may be seen on viewing the gelatine by transmitted light.

If the lime or electric lights be used there is no necessity for condensers, as the source of light itself is found for all practical purposes to be small enough without the employment of a stop. The frame to hold the films will be required to assume something of a globular or semi-globular form, with the source of light in its centre. The one I used had a radius of about two feet. The distance is certainly rather considerable, but then artificial light is accompanied by an immense amount of heat compared with solar light. Of course, dry films must needs be used, and these from the inferiority of artificial light will require more protracted exposure than wet films in the sun.

### Development.

In the ordinary negative process development is accompanied by the precipitation of metal on the film—in fact, by an aggregation of material. In the Woodbury process development results in the removal of matter already there for a reason with which photographers are already well acquainted, viz., that in this process the previously-soluble gelatine becomes insoluble in proportion as it is exposed to light. The exposed tissue having been laid, talc (or collodion) side downwards, upon a plate of glass is tied to it with a piece of cotton or silk thread, thus—



Probably by now some better plan than this has been devised. It is then laid, face upwards, in a dish and warm water poured thereon; by the use of a soft camel's-hair brush the soluble portions are washed away, and a picture in blue pigment remains, from which the final result may readily be judged of. The time required for this operation depends on the condition of the film. If it has been recently prepared and contains much water it will dissolve with ease. If, however, it has been kept for any length of time, or been dried, it will require soaking for an hour or two in heated water before the brushing is proceeded with.

Gelatine films mounted on collodion may be fastened to the glass plate by india-rubber varnish. Unless fastened in some way they curl up when in the hot water. Having washed until all the soluble portions are removed and the pictures show up well when viewed by transmitted light, we next proceed to dry them. Great care is required in this part of the process, as a sharp result or the reverse may be the consequence. (It is somewhat singular that sharpness which has remained in boiling water should melt away on drying. I am myself unable to account for it. Perhaps some other writer can explain.) The reliefs should be placed say two or three feet from a fire, but in a box open at the front. They should not be removed until they are dry, as a change of temperature or a sudden chill may spoil them. As they become nearly dry the box containing them should be removed further from the fire. The films when dry, if on talc, should be kept in a book, otherwise the relief is apt to crack away from its support. If on glass, however, this is not required.

D. Winstanley.

## SOME NOTES ON HEALTH AND HOLIDAYS.

Although it is hardly within the province of a contributor to a photographic journal to enter into a discussion of how the business of a photographer should be conducted, I think I am entitled to make a few remarks on the subject of holidays—a point which recently occupied the attention of the members of a young but vigorous society.

Regarding the general question of the necessity for a stated period for an annual holiday there is not much room for difference of opinion; the necessity has been recognised by nearly every trade and profession, and I hope there are few indeed so unfortunately situated as not to be able, once a year at least, to lay aside the cares and toils of everyday business life, and enjoy for a short time the repose and change of scene so necessary to keep the brain in a normal state of health. Presuming, then, that the desirability of an annual period of rest is generally admitted, and knowing that it is very generally carried out, my object is to direct attention to the question whether benefit to all concerned would be likely to be derived from the general introduction of more frequent and shorter periods of relaxation from business, with the consequent increased opportunities for change of occupation and physical exercise, especially of those muscles which may not in some particular branches of business be usually brought into play.

This holiday question has a double aspect—mental and physical. The student of physiology knows that the body cannot be long maintained in a state of complete health unless three things are regularly and frequently provided for—a due amount of active exercise for *every* muscle; a plentiful supply of pure air for the oxidation of the effete carbonaceous material of the body; and last, though not least important, sufficient work to keep the brain in constant action, but of such a varied nature that it shall not be kept sufficiently long engaged on any particular subject to induce exhaustion, or even to become too much fatigued by incessant mental strain.

My meaning will be made clear by the recollection of a fact that must have been frequently noticed by all observers. The eye can bear with comfort the action of ordinary white light for almost any length of time; if, however, it be directed for even a few seconds to a monochromatic light—say a bright red flame—and then suddenly turned towards a white flame, the latter appears to be not white but green. This illusion arises from the fact that the eye has become so fatigued by the action of the bright red that it fails to see the smaller quantity of the same colour in the white light, and so can appreciate only the green and blue of the spectrum, until by a few seconds of repose it has recovered its normal power. And so, in a somewhat similar manner, is the brain affected or fatigued by a too-prolonged attention to one particular line of thought, the result being an inability to do high-class work without occasional, nay frequent, periods, not of absolute rest, but of change of employment. It is undoubtedly the necessity for those three prime motors of healthy action that has led to the general introduction, especially during recent periods of high pressure in business transactions, of the weekly half-holiday. I do not, of course, mean to say that this result has been the outcome of such a train of reasoning; but I know full well that the effects of their absence have been felt, and that there is in human nature a wonderful power of arriving at a cause of injury and the remedy, without recourse to much abstract reasoning.

I am quite aware that many who will be ready to admit the necessity for a frequent holiday in most trades and professions are equally ready to make an exception in favour—or rather, I should say, the opposite—of the photographer, on the ground that he, as a rule, has shorter hours even in summer, and very much shorter in winter, than most other men who have to work for their means of living. But even if this were true—and from a pretty extensive acquaintance with both employers and employed I am much disposed to doubt it—it is really no argument against the desired relaxation, if it can be at all conveniently managed. It must be borne in mind that the work of the photographer is not by any means a mere mechanical exercise, but one the successful prosecution of which taxes his brain to the utmost. It is likewise, in most cases, carried on under the most unfavourable circumstances and conditions for the maintenance of a healthy state of the human system. The studio is frequently considerably above the temperature best suited for the maintenance of robust life, and so too often the operator is worn out from lassitude long before the day's work has drawn to a close. Nor is the dark room any better. Even if well ventilated, the atmosphere is always charged with vapours more or less injurious; and irritability, nervousness, and indigestion are in a great number of cases the natural and necessary results.

Another class of objectors is not infrequently met, namely, those who readily admit the necessity for an occasional or frequent holi-

day, but who are averse to its adoption on the ground that it would afford more time for indulgence in dissipation. This I do not at all admit as a valid objection, regarding it as a libel on a great majority of hard-working young men. Even if it were to some extent true a systematic process of weeding would very soon effect a cure of the evil; and I am rather disposed to think that more frequent intervals of rest would, by keeping the system in a natural state of vigour, materially lessen the craving for stimulants.

The question of how far such a system of holidays as it might be desirable to adopt may be consistent with business requirements is one with which I am not in a position to deal—it can only be settled by the profession itself; but I have no doubt whatever that in the amount of actual work done, and also in the quality of that work, professional photographers, and the general public too, would be gainers by its introduction.

While on the question of holidays it may not be out of place to call attention to a holiday of a somewhat different character which has been found to work admirably and to be productive of much good in Edinburgh. Some years ago the photographic society of the northern metropolis resolved to recommend a general holiday on which all the establishments in the city should be closed, and to organise an excursion at which both principals and assistants should be present —brought together, for one day at least, on an equal footing, and thus able unitedly to enjoy the beauties of nature, the delights of music, and the comfort of a good dinner. The attempt succeeded beyond the most sanguine expectations of its promoters, and the annual excursion is now said to be "one of the institutions of the city." In a vast metropolis like London such an arrangement is scarcely possible, but in most of the smaller towns in the kingdom I think it could be easily managed; and I am certain that wherever the experiment is properly made it will succeed—thus affording a day of true pleasure, and doing much to foster and intensify that friendly feeling and interest between the heads of establishments and the *employés* which it is so desirable should exist in all classes of commercial society.

AN OLD EDINBURGH ASSISTANT.

## ON PHOTOGRAPHING TREES.

PHOTOGRAPHY specially deals with truth, and thus becomes of infinite value both in commerce and in art. Whether she stand alone, offering only a modest production in monochrome, or be of use to the painter in colour, still truth must ever be her watchword. With the painter 'tis "first the beautiful, and then the true." Truth is in a great measure secondary to beauty in his estimation—not that he does not admire truth, but that he has not the power with his brush to paint like the sun. Photography must, therefore, for ever stand pre-eminently forward as the champion of truth, and, being so, she can afford to be made use of, as I have already said, both in commerce and in art.

In commerce photography gives the forms and patterns of articles used in many trades—watches, clocks, cutlery, jewellery, china, porcelain, and glass, machinery—anything that can be portrayed in form or shape, and so convey to the mind of the purchaser the truth of the ware vended for sale.

In art photography is wooed by the landscape painter, who can, at his leisure, put in his foreground the blades of grass, sedge, moss, furze, ferns, &c., with ease and rapidity. Could we photograph in natural colours, how charming! how lovely! People have often said to me—"Ah! if you could do that you would make your fortune;" and my reply has been—"I think not; if you look carefully at nature under its varied aspects, you will observe that its true charm and beauty consists in viewing it under a particular condition of light, and if by a happy coincidence you happened to photograph it under that condition, then it would be indeed lovely, while under dissimilar conditions it would be the opposite, *e.g.*, a landscape in the early morn, lighted up by the sun, the shadows of trees falling across the path, the road or the river, with all the dew sparkling here and there, each leaf, each blade of grass talking to you and telling in its own way of a bountiful Creator—gives to you, the beholder, a sensation of pleasure not readily forgotten; but the same scene in the early morn on a dull, sombre day would convey impressions the very opposite, and yet all the same objects are in both, the light having made all the difference."

Here is where the painter gains the victory over the photographer. He can render both these conditions to perfection, and by the aid of colour (especially in oils) can give charm to a scene which otherwise would be tame and dull. But then it is not truth. It is beautiful, but not true. We, as photographers, should aim at producing both; and in the hope of helping others to succeed as I have done the following remarks are offered.

To photograph trees *well* certain conditions are required, and unless they can be complied with success must not be expected. Patience, and great care in keeping everything clean, are imperative. Never to be in a hurry, good apparatus, chemicals of the best kind, and a careful selection of the lens for the particular condition of light under which each subject is to be taken, are all necessary to command success. Thus the result as truly conveys, pictorially, not only the species of tree, but also the character of the weather and atmosphere, the time of day, &c. Thus is truth in photography upheld over the painter's art.

Let us take examples. Many a landscape beautiful in itself owes its charm entirely to colour—to the different and ever-varying play of light upon the position of the tree, shrub, or mountain if seen with or without clouds; but what often appears beautiful to the eye is not so in reality. Upon the selection of the subject as to its composition; the graduation of one shade of colour into the other, so that it be not too sudden; the harmonising of the whole by oftentimes adding to the foreground leaves, sticks, and dead ferns of a particular colour, so as to produce harmony, having at the same time a correct knowledge of what the coloured ray given off from the same will be when acted upon by the light—all these are necessary component parts in a fine landscape. How, then, are the variety and harmony of the constituent elements in the picture to be secured? By a simple study of the solar spectrum, always remembering that from violet to yellow is *white* to grey, and from red to yellow is *black* to grey; that everything we see in nature partakes of one of these shades or a mixture thereof. The exposure necessary for the violet end is as one, for the red end as four. If red or its shade of crimson, orange, or pink prevail the exposure must be longer in proportion, the shadows, being black, requiring the longest, for even in them there is always detail. For white or grey colours a shorter exposure will be necessary; while if both are mixed together always expose for the darker shades, leaving the whites to take care of themselves.

To produce one single ray of white light six hundred millions of millions of vibrations of ether are necessary, while to produce the red ray only four hundred millions of millions are needful. Thus light may be likened to sound, the higher or treble notes requiring quicker vibrations from a thinner wire, while the bass or deeper sounds are procured from a thicker wire with slower pulsations. Much that is interesting on this subject may be gathered from many of the early numbers of THE BRITISH JOURNAL OF PHOTOGRAPHY, in reports of the meetings of the British Association.

I now pass on to a consideration of the chemicals and lenses. If architecture be combined with trees then it becomes necessary to use a non-distorting lens so as to get straight lines, unless we can throw them into the centre of our picture. But whatever lens we use we must have a moderately-large aperture, as the green ray is always less sensitive to the action of light. In hot weather the light is always slower than in a cooler temperature. To photograph the ash, the willow, the birch, and many of the more delicate grasses, when growing, we must rise early, or, if taking them in the middle of the day, we must be prepared with a collodion which will keep moist for some time, a grain per ounce of bromide of ammonium being added; so that in an exposure the lens may be capped and its action stopped, to be uncapped when the wind or vibration of the air has passed on—all this receiving careful attention until the exposure be completed. Hence the necessity for my counsel as to patience at the outset of this communuication.

A curious fact was noted by me at Ivybridge, and adopted afterwards in many pictures, as I found it conduce to the better rendering of detail both in shadows and high lights. The accident which led to the discovery was as follows:—I had focussed and arranged to take the picture marked "A."* My slide was in the camera with the plate, when on the centre of the bridge a man wearing a white slop jacket planted himself. As this high light would have completely destroyed the harmony of the subject, I made a request that he should move away. The reply was anything but civil, not being fit for gentle ears. I looked at my watch; it wanted six minutes to one p.m., at which hour the paper-mill bell would ring for the hands to return to work. I looked upon my plate as lost. However, it was useless preparing another till he went away; then, not expecting to succeed, I exposed, giving 150 seconds' exposure. The result you have before you.

I can only explain the matter thus:—In its first sensitiveness the plate is like a schoolboy just let out of school for ten minutes'

* This and the other pictures to which reference is made have been sent to us by Mr. Warner.—EDS.

recreation after hard study. Work is not thought of; all is in a state of excitement and joy at getting into the air; but when he returns, and settles down fairly to work, then more is really learnt in a comparatively shorter period than if he had worked on without the coveted pastime. Just so with the plate. If exposed in its first blush of sensitiveness it is so eager to imbibe the light that it misses, as it were, the most important portions of the detail, taking them in but allowing them to be swallowed up by the too vigorous action of the light; while, by resting without exposure until this has passed away, we obtain a continuous action from beginning to end, each atom of detail receiving its proper exposure. In this picture there is a great gradation of tone from black to white. I afterwards adopted this "dodge" (if I may so term it) with other pictures with the best results, of which I send you examples.

The picture marked "B" is one of bright sunshine and deep shadow. It was taken in the way just described. In the deep shadows on the grass there is detail. You will also notice the half-tone in prints marked "C," "D," and "E." All these pictures were taken in the same way.

As a rule, I usually find that landscape workers give very short exposures, seeming to think that if an *approach* be got to the truth the result must be beautiful. That eminent professional landscape photographer, George W. Wilson, always, I believe, gives long exposures. Like myself he thinks that everything takes time, and that nothing should be done in a hurry.

In conclusion: If the landscape worker desire to get fine detail in individual subjects—such as trees, ferns, grasses, &c.—let a day without sun be selected, and a single lens employed. Use a mixture of two collodions—one selected for density, the other for half-tone. (There are many such in the market, so I need not here particularise.) Let there be a moderately-strong developer with a weak aqueous solution of iodine used after fixing and before intensifying. The landscape photographer will never regret following the advice here given. Let all ever keep in view this old German proverb—"In everything do thy best, and leave the success to God."

W. Harding Warner.

## FOREIGN NOTES AND NEWS.

Economy of Silver.—Nitrate of Aluminium in the Silver Bath.—The Photographic Exhibition at Vienna.—M. de la Bastie on Toughened Glass.

It is assumed that a finished silver print only retains about three per cent. of the silver consumed in its production, and it is known that even the most skilful worker has not as yet succeeded in recovering anything like the remaining ninety-seven per cent. from the residues and waste; so that attention may profitably be turned to adopting the most economical way in which this metal can be employed. Such is the plea on which various suggestions on this subject have lately appeared in the *Photographische Mittheilungen*, the gist of which we venture to give even though it should contain nothing very novel.

With an eye to economy Herr Lindner silvers his plates, in what he calls Osborne's way, with two baths. This he explains to mean that when the plates are almost silvered in the first bath they are removed to the second. The first bath soon becomes dirtied with iodine, &c.; but in spite of that the plates are good, owing to the after-silvering in the second. When about a hundred plates have been silvered he pours a certain quantity of the solution from the first bath into a reserve bottle, and substitutes a like quantity from the second, or purer, bath. He then adds to the latter half a gramme of nitrate of silver per plate, dissolved in eight grammes of water. In this way the strength of the baths is kept up without an entirely new one being required.

When a sufficient quantity has accumulated in the reserve bottle it is allowed to evaporate until it becomes of an oily consistency, dissolved in five parts of water, filtered, a little nitric acid added, and again evaporated until a thin skin has formed on the upper surface. It is then allowed to cool, and when cold it will be found that a large proportion of the silver has crystallised. After washing, these crystals may be used like fresh nitrate of silver; but it must be borne in mind that this can only be done with the negative process, as they always contain a little iodine, which has a disturbing influence upon the positive process.

In order to lessen the loss of silver by the dripping of the plates Herr Lindner fixes a tin trough filled with blotting-paper under the holes where the silver runs off. In silvering paper he has fastened a round glass rod crosswise over the porcelain silver bath, close to its edge. When the sheet is taken out of the bath it is drawn over this rod, so that it is almost dry, thus saving the time the sheet usually requires to drip, as well as a great deal of silver. In this way he calculates that about one and a-quarter gramme of silver is required per sheet. Herr Quidde thinks that old soda baths generally fetch far too low a price, as a great deal of silver, and gold as well, can be recovered from them if they are treated with sufficient quantities of muriatic acid and sulphate of iron (for gold). The residue, which consists mainly of sulphate of silver and sulphur, must be recovered by a smelter. Grüner's method consists of a series of vessels filled with hundreds of iron filings, through which the soda, acidified with a little sulphuric acid, trickles slowly, so that it remains forty-eight hours in these vessels, and both the gold and silver return to their metallic state.

The Abbé Laborde declares that the addition of nitrate of aluminium to the silver bath materially assists the coagulation of the albumen, and thereby effects a great saving of silver. Dr. Schimann communicates to the *Mittheilungen* the following as the result of his experiments with this nitrate. He added five per cent. of nitrate of aluminium to his positive bath, and then watched the effect. As Laborde stated the coagulation of the albumen was more complete, in so far as that the bath was far less polluted by undissolved albumen; but then the pictures toned very slowly, and at some places they would scarcely tone at all, and the tone of all was somewhat monotonous. Nitrate of aluminium is difficult to procure, being nowhere kept in stock, and what Dr. Schimann used he had to get specially prepared for himself. In any case he thinks it will always be a dear chemical, and that its price will neutralise any advantage to be gained from the saving in silver.

Photographic exhibitions seem to be "the thing" on the continent this year, no fewer than three capitals having projected similar undertakings. First, there is the exhibition now open in the Academy of Art and Industry at Vienna; then there is the exhibition to be opened this month by the Brussels section of the Belgian Photographic Society, under the special patronage of the King; and, lastly, the Berliners, determined not to be outdone, and remembering that they have not had a photographic exhibition for ten years, arranged to open one in the autumn, immediately after the close of that at Vienna. But

"The best laid schemes of mice and men gang aft a-gley."

The indispensable Dr. Vogel being called away, this third exhibition has been postponed.

We have received the official catalogue of the Viennese exhibition, but no prize-list has yet been published. In the catalogue the names of the exhibitors—of whom there are one hundred and seven—are printed alphabetically, which makes it somewhat difficult to classify the subjects, or to ascertain the number of pictures exhibited. Portraits are shown by thirty-six exhibitors, landscapes by twenty-three, composition pictures by twelve, interiors by eleven, enlargements by five, lichtdrucks by four, photolithographs by four, heliographs by four, autotypes by two, microphotographs by two, stereos., carbon prints, and various kinds of photographic apparatus, photographs finished in oil and water colours, &c.

There are two exhibitors from England, one from Ireland, and one from the United States, viz., S. Hedges, Lytham—animal pieces; H. P. Robinson, Tunbridge Wells (Med. Vienna, 1873)—three combination prints; T. M. Brownrigg, Dublin—four landscapes; T. T. Woodward, Assistant-Surgeon Army Medical Museum, Washington—nine enlargements, of different sizes, from microscopic objects.

Aubel and Kaiser exhibit twelve Aubeldruck pictures, reproductions of copperplates, some of the same size as the originals, and a number of assorted specimens printed from lithographic stones by the same process.

Theodor Creifelds shows a large collection of lichtdrucks printed from stone, some with an enamelled and some with a dead surface. The subjects are very various, including photographs from nature, from drawings of machinery, and from paintings, &c.

Henri Cremière shows heliographic portraits, some of which have been transferred from steel plates by means of the asphalt process.

Anton Goldmann shows a cooling apparatus of a new construction for keeping the dark room and chemicals fresh in the height of summer; Carl Haack diapositive enlargements of microscopic preparations copied upon tannin plates; Franz Heiler anthropological studies in Paraná, a province of Brazil; Josef Leipold three heliographs produced by Pretsch's method.

Johannes Linck exhibits a portrait printed upon albumenised paper and coated with a mixture of white wax and mastic varnish until transparent, coloured on both sides with oil colours, and fastened to the pasteboard with gelatine. (This process seems very similar to Wünder's.)

Dr. August von Lorent has sent a number of landscapes, and mentions that they are all taken with wet collodion and developed according to Hardwich and Dawson's formulæ; Ferdinand Mayer some particularly large cameo photographs.

H. A. Meynier, Marseilles, shows sulphocyanide of ammonia as a fixing agent (?); J. D. Möller microphotographs, taken with a lens constructed by the exhibitor of photographs, from Herr Schröder's calculations; Trapp and Münch specimens of albumenised paper; Ph. Remelé views in the Lybian Desert; Römmler and Jonas lichtdrucks printed by schnell press; Max Liebe portraits taken in a glass house glazed with *ground* glass, and without blinds or curtains; Dominick Stahala an enlargement printed upon Stahala's tapioca paper; Strumper and Co. lichtdrucks—the *Destruction of Jerusalem* and the *Reformation*—reproduced in enamelled lichtdruck, after Kaulbach's engravings, dead lichtdruck prints; Carl Kesseler a new method of enamelling photographs, occupying less time than the gelatine process; C. L. Zamarski phototypes, photozincographs, photolithographs, photogravings, &c.

The enlarging apparatus most in favour seem to be van Monckhoven's and Liesegang's. Of course the objects we have mentioned form only a small proportion of those exhibited by these gentlemen; and, consequently, a still smaller proportion of the whole exhibition. We have in this enumeration overlooked the ladies, who have seven representatives at the exhibition. Fraulein Antonie Bogner shows specimens of her retouching varnish and way of applying it. We gave an account of this varnish a short time ago.

M. A. de la Bastie, the discoverer of the recently-published method of hardening glass, has communicated to the *Bulletin de la Société d'Encouragement* a lengthy note on the properties of the so-called "toughened glass," from which we condense the following facts. Without entering into theoretical speculations, M. de la Bastie gives the result of his experience in the manufacture of this new substance. In the first place he has found that all liquids are not suitable for use in the hardening process, the effect produced by different liquids varying from two to ten times that exhibited by others. The object, then, is to produce such a condition of hardness as will suit the special purpose for which the product is required. In the attainment of this M. de la Bastie has calculated for different liquids what he terms the "co-efficient of hardness" which each of them gives to the glass. In obtaining this "co-efficient" three facts have to be considered, viz., the composition of the tempering bath, the proportions in which the different ingredients are mixed, and, finally, the temperature of the bath. The last is not the least important of the three. At a certain temperature the glass will fly into innumerable pieces when dipped into the bath; at another it will acquire a certain degree of hardness; while at a third point it attains the maximum. Furthermore: the chemical composition of the glass exerts so great an influence that in order to produce the same effect with two kinds of glass the temperature may vary as much as two hundred degrees. One of the principal difficulties in the process has been the ignition of the bath of oil upon dipping this intensely-heated glass; but this has been surmounted by the manufacture of special apparatus for the prevention of such ignition. Another serious obstacle has been that to produce the best results the glass is heated to such an extent as to become malleable, in which state, if left to itself, it rapidly loses its shape. This robbed the process of every claim to utility, and rendered it a mere curiosity. M. de la Bastie has, however, introduced a novel course of treatment which entirely obviates the difficulty, and brings "toughened glass" within the range of inventions of practical utility. In calculating the probable cost of the process M. de la Bastie states that two workmen can harden in twenty-four hours, with an expenditure of fuel and other matters of the value of fifteen francs, from eight to ten thousand watch-glasses. M. de Lubac, who read the paper, performed several experiments, showing the advantages offered by the new product. A *thick* glass capsule was used for boiling water in, while plates of the hardened glass were thrown about the room without suffering fracture. By dint of violent blows with a hammer one piece was broken; but, instead of breaking like ordinary glass into three or four portions, it was reduced to innumerable minute particles.

# Meetings of Societies.

## LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The monthly meeting of this Association was held on Tuesday evening, the 29th ult., at the Free Library, William Brown-street,—Mr. W. Atkins, Vice-President, in the chair.

The minutes of the previous meeting were read and confirmed.

Mr. J. A. Forrest gave a description of several useful photographic apparatus which he had seen during a recent tour. He also strongly advocated the retouching of landscape negatives, instancing some large negatives which had been seen by the members, but which were now so improved by artistic retouching that he could scarcely believe the new prints were from the old negatives.

Mr. Phipps mentioned that to touch up small negatives involved a great deal of time and also artistic skill.

Other members thought that retouching would have a tendency to induce careless manipulation, instead of excellence in the original negative, which they should strive for. When necessary, natural clouds could be got by double printing.

Mr. Forrest exhibited a print, by Mr. Pettitt, of the *Setting Sun*, as an example of what could be done by double printing.

A communication from the Rev. J. D. Riley (who was unable to be present), relating some of his experiences in making emulsion, was read by the Secretary.

Mr. Tyrer exhibited several 12 × 10 negatives of Buildwys and Much Wenlock Abbeys, taken on the last excursion. He said there was plenty of work for a day there.

Mr. Weber showed a number of prints of horses and cattle taken by him on Kennett's rapid gelatine plates. Both horses and cattle had been perfectly still, showing the capabilities of these plates for such work. He (Mr. Weber), in reply to several questions, said that though taken in dull morning light the exposure had been almost instantaneous, the lens being capped and uncapped as quickly as possible. The attention of the horses was attracted by a man behind a bush beating a can with a stick.

A special meeting of this Association will be held on Tuesday, the 13th instant, when a demonstration of the autotype process by Mr. H. Taylor will be the attractive feature.

# Correspondence.

Meeting of the Photographic Society of France.—M. Vidal's Photochromic Picture.—A New Pocket Camera for Outdoor Work.—A New Enlarging Apparatus.—My Visit to England.—Mr. Clarke's New Photographic Studio.—The Autotype Company's Works.—Mr. Henderson's Enamels.—Liverpool Dry-Plate Manufactory.

The Photographic Society of France held its monthly meeting on Friday last, the 2nd instant,—M. Balard, President, in the chair. The evening was occupied to a large extent by numerous presentations of carbon and photolithographic proofs, which were exceedingly fine. The honours of the evening, however, were reserved for M. Léon Vidal. That gentleman presented to the Society a very fine picture in colours, being the first executed in the new establishment of M. Daloz, and of which M. Vidal has taken the direction. This picture is a reproduction of an oil painting by M. Marchetti, well known to the public by its having been admitted to and admired in the last exhibition of paintings in Paris.

The photochromic picture laid before the Society had not the least appearance of a chromolithographic proof—it being vigorous and lifelike, standing out, as it were, in bold relief, and having, in fact, the appearance of the oil painting itself. The greatest praise that could be given to M. Vidal was that vouchsafed by the painter himself when he declared the copy to be "a faithful reproduction" of his work.

M. Vidal informed the Society that, first of all, a proof was printed deep enough in its shades to be sold to the public; then this proof received on its surface the necessary colours to convert it into a photochromic proof, and what was wonderful was that, although a quantity of colour was then put over its surface, the proof did not become too dark or "impastated" in its shades as an absorption of colour took place. As to the design, it is impossible for that to be incorrect; as the picture is composed of the photographic proof coloured, not by hand, but by machinery. The black and white proof becomes lost in the colours, and by their blending harmoniously create homogeneous shades and tones. M. Vidal concluded by giving some indication as to the number of proofs that could be drawn off daily in the manufactory of which the whole organisation was entrusted to him, and made at the same time some remarks as to the cost of proofs, whether in monochrome or polychrome.

This communication provoked some discussion among the fatty-ink, carbon, and lithochromic printers present; for as M. Vidal said that he should be able, ere long, to print upwards of 8,000 prints daily these

gentlemen were astonished, and imagined they already saw "grim ruin" standing before them.

The President settled the discussion in a very satisfactory manner by a phrase which characterises and puts forward the late invention of M. Vidal in its true colours. "It is a new art," said he; "it can destroy nothing, but will add to our stock of photographic knowledge."

The invention of an easy and practical means of printing in colours will be received, I am certain, with great pleasure by the public in general. The time is not far distant when the homes of our artisans, and even of our labourers, will be decorated, not by an unsightly woodcut, but by the true reproductions of ancient or modern painters, which at the present day can only be in the possession of the happy few. There will be created in the million a taste for art, and intelligence in the masses will be so sharpened as to enable them to judge of beauty. Our albums, even, will not then be filled with black and white pictures, but they will be ornamented with polychromic views and portraits at once pleasing to the eye and interesting to friends.

M. Jonte then presented a new camera which he had constructed for dry-plate work. This camera is a very pretty little thing, well made, of excellent workmanship, ingenious in its construction, and very light. Several members of the French Alpine Club have chosen it for their excursions up the mountains, as it is very small; for the apparatus, together with several dry plates, can be carried in the pocket.

M. Derogy, the well-known optician, presented a new apparatus for photographic projections or enlarging portraits, views, &c. The most interesting part of this apparatus is the adjustable mirror, of which the gearing is so well combined as to make it a very manageable instrument of precision, either worked by the hand or driven by clockwork.

The meeting terminated with a few projections on the screen.

I here take occasion to bespeak the pardon of the general readers of this Journal for the interruption in my communications caused by my recent visit to England; but I trust that when I inform them of the cause, which was ill health, they will willingly extend to me their forgiveness.

My visit to "Old England" was made with a double aim—the first being an endeavour to restore health; the second, to see what progress our art had made during the last few years. I went, I saw, I was enchanted by finding the photographic art so flourishing. Skilful men have entered into the list, and in country as well as in town I found an artistic taste displayed which I should have sought in vain ten years since.

I remained three days in the pretty little town of Bury St. Edmund's, so full of historical monuments and *souvenirs* of the past; here, as elsewhere, photography has made undeniable progress. I paid a visit to one of the best artists of that ancient borough, Mr. Clarke. This gentleman is now about to change his abode and take possession of a much larger establishment in the principal street of the town. Such an establishment I may say, by the bye, a photographer would never have thought of a few years ago, even in his most sanguine moments or in his golden dreams. "Advance with the times! Forward! forward!" must be the motto of all photographic artists, without which they will be thrown out of the charmed circle. All who endeavour to do this succeed sooner or later. Mr. Clarke has followed the golden rule. In this lies the secret of his success and that of others. In his new studio he is introducing all the new ideas proposed by scientific men in the photographic journals, which will be a benefit to his customers and a prolongation of his renown. May success crown his efforts in his new establishment!

In London, as well as in its immediate neighbourhood, great manufactories have been erected, providing work for the labouring classes. Carbon and fatty-ink printing have made rapid strides. By special invitation through Mr. J. A. Spencer I was enabled to visit the Autotype Company's works, at Ealing Dean, near London.

On my arrival Mr. Spencer honoured me by becoming my *cicerone.* He conducted me over the chemical department and showed me the grinding of the carbon by steam power and its mixture ready for the coating of the paper. In the next room a workman was sitting before a trough filled with the black mixture, over the surface of which, by means of machinery, was passing the paper, which, after it had received the coating, was carried along a table, cut into pieces of about six yards in length, which were then hung round the room to be dried. This operation is done by a hot-air apparatus fitted throughout the whole room. The damp air is carried off by a very ingenious apparatus fixed in the roof, composed of an Archimedian screw turned by the wind as well as by the upward current of air. When the paper is sufficiently dry it is rolled up, a great part being sent all over the world, and the remainder employed on the premises. The Autotype Company not only prepare carbon paper but also print negatives for the trade.

I was then introduced to another portion of the building, where several workmen were employed in printing positives in carbon. This was a large room, or rather long room, being about twelve yards in length. On the northern side is a glass house to within about a yard from the floor. Under this glass roof are about eight or ten platforms on wheels, supported by tramways, on each of these platforms being laid a certain number of printing-frames to which are attached photometers. When these frames are ready to be exposed a slight push is given to the platform, and it runs forward about four yards into the courtyard if fine, but only three yards if the weather be wet, which keeps it under the glass house, and so protects it from the pluvial downpour. When sufficiently exposed the operator pulls a cord and the train or platform returns into the shade. The proofs are taken out of the printing-frames and then put into a large trunk on wheels, which, when full, runs down another tramway into the developing department.

We followed this train, and entered an extensive workshop containing several large trays of warm water, into which the proof is plunged after having first of all undergone the operation of transferring. A jet of warm water is now poured or thrown over the surface, and the image becomes sharper and cleaner as the portions unacted upon by light are washed out. I need not here speak of the chemical action of the chromic salts, or their pernicious action on some of the workmen, &c. This subject has been so ably treated by others in THE BRITISH JOURNAL OF PHOTOGRAPHY that I will confine myself to giving only a sketch of what I witnessed.

We entered into the drying-room, and then into the retouching-room, in which were several young women busily employed, and all looking happy and contented. We then entered into the *camera obscura.* Do not smile, dear reader, for in truth we went *into* it. The Company have converted a very large room into a camera for enlarging, and in which the operator can move with ease. The focussing-glass is placed in a kind of easel, which can be pushed forward on a tramway towards the lens or pulled backwards at the will of the operator. Adjoining this room is the sensitising and developing chamber. I very much admired the ingenuity displayed in the construction and arrangement of the balancing silver sensitising baths—the most convenient I ever saw. Here are made large and small negatives on glass. I saw several 4 × 3 feet, the manipulation of which, we know, is not child's play.

My guide then introduced me into the department where printing in fatty ink is carried on. I there saw a great number of presses worked by young women. I here asked myself if the idea of M. Despaquis—that of replacing hand-work by steam power—will bring forth fruit; for it must be acknowledged that it is rather hard work for young girls, even though aided in pulling the lever by a strong and willing youth.

After having inspected many other parts of this very extensive and important establishment, and examined with pleasure a large number of *chefs d'œuvre* lately produced, some of which Mr. Spencer kindly pressed on me to accept as a *souvenir*, I returned to London well pleased with my visit, and thankful for the intellectual treat afforded to me at Ealing.

The following day I paid a visit to the establishment of Mr. A. L. Henderson, in King William-street, who is celebrated for his artistic productions in enamels. That gentleman invited me to sit for my portrait, with which request I acquiesced with pleasure. Although the weather was dull the time of exposure was very short, being only four or five seconds. A few hours afterwards a beautiful enamel was deposited at my hotel. Indeed, I do not know how to thank Mr. Henderson sufficiently for the agreeable surprise and astonishment this caused me. Is it that Englishmen are quicker in their manipulations, more advanced in their knowledge, or better aided by their opticians? I must let the truth ebb out: such activity and rapidity are unknown here in France.

I visited the Liverpool Dry-Plate Company's works, in the company of one of the Editors of this Journal, and was very sorry not to have met with Mr. Stillman, for whom I had a letter of introduction. Nevertheless I was graciously received by Mr. Mawdsley, who explained his manner of operating, exposure, and development of his emulsions and pellicles. I promised that gentleman to introduce them into France; but I find

that the Custom-House officers absolutely object to let any parcel what ever enter this country without being opened.

I could say much more on what I saw in England, but space will not permit me. I am happy to say my sojourn there has been pleasant in many respects. My health is better. I have had the pleasure of seeing our art in a prosperous state. Public judgment is itself changed, and is now able to appreciate what is really good. A brilliant and happy position is opened to all. E. STEBBING, *Prof.*

3, *Place Bréda, Paris.*

## "URANIUM AND ITS USES."

*To the* EDITORS.

GENTLEMEN,—I certainly did assume Mr. Werge to have been ignorant that the Wothlytype process was a collodion one, as he spoke of the inutility of adding nitrate of uranium to the *printing bath* in the Wothlytype process. It now appears from his letter in your last number that it was a misstatement, and not want of knowledge; but it is of no advantage discussing this matter. With regard to Mr. Werge's statement—that had I attended the meeting I should have seen unsatisfactory collodio-uranium prints done by him—I must say I fail to see what I should have gained, as I already see by his writings that Mr. Werge is ignorant of the correct uses of nitrate of uranium, under which circumstances of course his work is bad.

With regard to the addition of nitrate of uranium to the silver bath, the only occasion I mentioned it was casually in my paper; and I am bound to say that I consider it an act of grave discourtesy on Mr. Werge's part to pronounce himself on the matter without asking me for a definite formula, or if I had any recommendations to make. He would also have done well to have addressed the same question to Captain Abney, who, in his instructions to the workers on the transit of Venus expedition, points out the increase of sensitiveness gained by the addition of nitrate of uranium to the negative bath. Had Mr. Werge taken this course he would have avoided the exposure of the singular error he has made.

Mr. Werge alludes in his last letter to the "motives of process-mongers." Would he kindly explain what "process-mongers" are? It is a new word, and requires explanation, which I shall be glad to see from Mr. Werge in your next number.

There is nothing more in Mr. Werge's paper *On Uranium and its Uses* that I think I need notice. It is merely a record of what he himself has failed to do, and entirely ignores the labours of others. In fact, to read such a paper before a learned society makes one exclaim, after reading it to the end, in the words of a well-known poet—

"Parturiunt montes, nascitur ridiculus mus!"

—I am, yours, &c., H. STUART WORTLEY.

*July* 6, 1875.

## PAPER AS A BASIS FOR NEGATIVES.—IMPROVING MARGINAL DEFINITION.—GELATINO-BROMIDE.

*To the* EDITORS.

GENTLEMEN,—Of all the methods which have been proposed for the substitution of paper for glass for negatives, none is so simple, or so truly a "paper" process, as that in which the paper itself forms the vehicle for the sensitive salts.

Now, although no such process has been successfully worked—at least to most people's thinking—still it seems to me that, if we had only a slightly more homogeneous paper than our best photographic ones, we might overcome the granular appearance caused by the texture of the paper.

If I remember aright the new French paper—"*papier vegetal*"—is a comparatively textureless paper. Granted that it is, it might be floated on a bath composed, say, of a bromide with, perhaps, a little gelatine dried and floated on an eighty-grain nitrate bath. The subsequent washing would be easily managed; and certainly the whole of the operations of preparing—not plates—*paper* for exposure in the camera would be most easy. The work might be further simplified if the salted paper were manufactured and sold like albumenised paper.

During the development the paper is likely to become stained. In that case nothing can be done with the negative, unless the discolouration—perhaps also unequal—be removed. Now, is there nothing that will remove these stains, and yet not injure the image? I have an idea that I have lately read of some eliminator of pyrogallol stains, and I have also an idea that it was tartaric acid.

Well, now, supposing that we have a good, clean negative, it remains to render it translucent. This is, of course, easily done; for, looking through the negative, perhaps a slight granularity or texture of the paper will be observed. In that case, I propose—I do not mean that I am the first to propose—making another piece of the same paper translucent and placing it in the printing-frame over the negative. I think now that it would require a keen eye to detect coarseness of image; and if the negatives are not to be enlarged, and of course the quality of the image be good, such a process might be called "successful." But I am entirely dependent for this result on a superior quality of paper. I am not at all certain that any of the papers now in general use would answer the purpose sufficiently well.

Reverting to Professor Piazzi Smyth's "plano-concave lens." Certain opticians seem still to be extremely doubtful as to the virtues of the same; in fact, it seems to me that men will not be convinced until they have seen, at least, photographs of the same subject taken both with and without the modification, and have witnessed the large amount of "sharpness," or what would be equivalent to "rapidity" gained. I think that if Professor Piazza Smyth would kindly send some of his results to your office for the inspection of those interested, accompanied by a written description, then sceptics would be able to judge for themselves.

I have just developed two plates, prepared with Kennett's pellicle—one over three weeks ago, and the other lately—from a drachm, or so, remaining at the bottom of a two-ounce bottle after preparing the former plate. Subsequent to preparing the first plate, three weeks ago, I added a little extract of cloves to the remaining drachm. The plates, on exposure in the camera, seem alike in every respect. Query: Did the clove extract preserve the emulsion?

I may say that I continued the use of pyro. in alcholic solution, and can never attribute a mishap to its use, although very occasionally a slight wrinkling of the edges may occur; but, then, how often this has happened to those who use only water! I also, if I have given the minimum of exposure, do not use restraining bromide in the developer, though it is as strong in other respects as that recommended by Mr. Kennett. Of course this treatment would not do if one portion of the negative was greatly over-exposed.—I am, yours, &c.,

*Cotheridge Court, near Worcester,* HERBERT B. BERKELEY.

*July* 5, 1875.

## AUTOTYPE AND LAMBERTYPE PROCESSES.

*To the* EDITORS.

GENTLEMEN,—As there seems to be some little confusion of ideas as to our allowing the use of our autotype patents to the licensees of the Lambertype and chromotype processes, permit us to say that *we* have done no more for the said licensees than we have always done for the profession generally, viz., to allow the free use of our patents (except for the production of works of art) on the sole condition of the purchase of the materials from ourselves.

We recognise in M. Lambert's processes some improvements, very many ingenious ideas, and a method of carbon printing which may, perhaps, be worked out to commercial and practical purposes.

We are anxious to aid these efforts by the production of suitable tissue, the supply of apparatus, and to do whatever we are able to secure the universal production of photographs in a permanent form.—We are, yours, &c., SPENCER, SAWYER, BIRD AND CO.

*Autotype Works, Brownlow-road,*
*Ealing Dean, W., July* 7, 1875.

## SHORTENING THE EXPOSURE IN THE CAMERA.

*To the* EDITORS.

GENTLEMEN,—Seeing that some doubt has been cast upon the conclusions deduced by Mr. Werge from the very complete series of experiments carried on by him to ascertain whether or not any increase in sensitiveness was obtained by the addition of nitrate of uranium to the silver bath, I send you a brief statement of my experience on the subject.

I made up a bath containing thirty-five grains of nitrate of silver and ten grains of nitrate of uranium per ounce, iodised it in the usual manner by the addition of iodide of potassium, and to this solution carbonate of soda was added until a permanent precipitate of carbonate of silver remained undissolved after violent shaking. After standing about twelve hours, with occasional agitation, the whole was poured into a filter, and the bath allowed to filter through the deposit. Having thus ensured the complete removal of any trace of free nitric acid, I sensitised in it plates coated with Mawson's collodion (iodised twelve hours previously), and found it gave clear pictures without the addition of acid, and was even in that condition considerably less rapid than an ordinary slightly-acid bath of the same strength, but without uranium, against which it was tested.

Having thus satisfied myself on the only point in Mr. Werge's most conclusive experiments as to which any possible uncertainty could exist, I feel that any hope we may have entertained of shortening exposures by the aid of nitrate of uranium employed in this manner must be abandoned, and that the less we have of it in our baths the better.—I am, yours, &c., R. W. ARTLETT.

110, *Westbourne-grove, Bayswater, July* 3, 1875.

## MEETINGS OF SOCIETIES FOR NEXT WEEK.

| Date of Meeting. | Name of Society. | Place of Meeting. |
|---|---|---|
| July 13 ........ | Liverpool Amateur ............ | Free Library, William Brown-st. |

## EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at the small cost of one shilling in our advertising pages. This column is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

Wanted to exchange, a regulation Snider rifle and a view lens for 10 × 8, for a stereo. camera.—Address, J. W. Newall, 2, Museum-terrace, Chelmsford.

A pocket telescope by Ross or Dallmeyer, and small rolling-machine, wanted in exchange for photographic apparatus.—Address, James Martin, Insch, Aberdeen.

A first-class double gun (muzzle-loader), cost seven guineas, offered for a 10 × 8 or 12 × 10 Ross or Dallmeyer's wide-angle lens.—Address, A. D., Cromwell Villa, Wilton-road, Salisbury.

## ANSWERS TO CORRESPONDENTS.

Photographs Registered.—
William Rowe, Leicester.—*Portrait of the Rev. Robert Smith.*
John Powell, Milford Haven.—*Portrait of Lieut. P. C. Walker.*
A. G. Massey, Armagh.—*Group of St. Mark's Sunday School Children; Group of Irish Good Templars, Portadown District.*

☞ *Correspondents should never write on both sides of the paper.*

J. T. C.—The fabric is rather too dark and sombre-looking.

G. B. P.—The lens is an obvious forgery. It is returned as directed.

Chemist.—We shall ascertain the desired particulars from the gentleman named.

K. Gordon.—The lenses of a quarter-plate combination are unsuitable for making a telescope.

H. W. W.—If the number of the Journal containing an account of the drying-box be placed in the hands of an intelligent house carpenter he will not experience any difficulty in constructing one of a similar kind. The directions there given are singularly clear.

Nelson Secundus.—The purple tint on the pictures arises, in all probability, from the toning being conducted in a room too strongly lighted, the free nitrate of silver not having been thoroughly washed out previous to immersing the prints in the toning bath.

"Solomon's Uranium Dry Plates."—With reference to a statement in last number, copied from the *Mittheilungen*, respecting "Solomon's uranium dry plates," Mr. Solomon requests us to state that these plates are not prepared by him, but by the Uranium Dry-Plate Company, for which he is London agent.

Turtle (Andaman Islands).—1. We are not acquainted with the toning-bath employed by M. Silvy. Perhaps some correspondent can give the imformation.—2. The lens you describe is one of a rather primitive kind, and as a portrait lens is slow in action. We have seen good portraits taken by lenses of this class, but they were inferior to those obtained by good English lenses.

F. R. S.—The occasion for your letter of remonstrance having passed away, there is no necessity for its publication. Thanks, however. In reply to separate letter it is the *first* edition of *Weale's Rudimentary Series in Photography* to which reference was made. The second edition has been prepared by a different compiler, and contains no allusion whatever to the matter in which you are specially interested.

B. B. (Paris).—The foci of the two lenses may be brought into a state of perfect coincidence by varying the amount of separation between the front and back lenses of one of them. Judging from the pictures enclosed we imagine that there is at present a difference of about a quarter of an inch between their foci, that on the right-hand side of the camera being the longer. The tube of that one should be slightly shortened.

C. W. (Ghent).—Your experience respecting the defective sharpness of carbon, as compared with albumenised silver, prints, especially for small pictures, is shared by others. We have, however, seen some carbon prints which were very sharp, and upon examining one of this kind we find a note on the back intimating that it was produced from carbon tissue of a thin quality which was sensitised on a very strong bichromate bath.

F. J. O'B.—The *rationale* of the method of producing oxygen by M. Mallet's method is as follows:—Subchloride of copper, mixed with a little sand, having been moistened with water and placed for an hour in a horizontal retort through which a current of air is conducted, becomes an oxychloride, which, on the application of heat, gives off its oxygen and returns to its original condition as a subchloride, ready again to be converted into the oxychloride and to yield up its oxygen as before. During the time the copper is being oxygenated by the passage of the air it should be agitated so as to allow every portion to be exposed to the passing current.

Colonel Thompson.—The quickest and easiest way by which to reduce an old bath, or to convert it into metallic silver, is to immerse in it one or more slips of copper, when the clear solution of nitrate of silver immediately becomes clouded in the vicinity of the copper from the rush of opaque atoms of metallic silver, which deposit themselves on the surface of the baser metal in such quantity that the mass breaks off and falls to the bottom of the vessel, its place being supplied with similar aggregations until the solution is denuded of the argentic salt. The silver and nitric acid having but a feeble affinity for each other, by the introduction of the copper the nitric acid leaves the silver, which is thus precipitated in the metallic form.

Scrutator.—We do not know how the firm named platinise their glass, but we are aware that samples precisely similar to theirs may be prepared by applying to the surface of glass (using a camel's-hair brush for the purpose) a coating composed of chloride of platinum, essence of lavender, litharge, and borate of lead. The glass is then heated in a muffle.

S. T.—The coffee process may, in the way of imperfection, be all that you have heard attributed to it; but it will, in the hands of a photographer of far less than average experience, produce better results than those you enclose as the result of experiments with the morphine process. We can at present only give you the same advice that we have always given under similar circumstances—Do not take the word of a tyro with respect to the efficiency of any process, but try it for yourself.

W. E. Batho has sent us a communication in reference to the recent controversy in which he has taken a part. From his letter we take the following extract, with which we positively close the discussion:—"In the world below the waters there is a fish which, when attacked, manages to escape by ejecting a fluid that renders the surrounding water opaque, and amidst the confusion it quietly takes its departure. In the world above the waters there are sometimes actions performed bearing some similarity to this device of the fish. I am charged with—1st, wasting time over ideas founded on no evidence; 2nd, fallacious reasoning; 3rd, applying epithets to such reasoning; 4th, attributing reasoning, epithets, and all to some one else; 5th, not dealing with the point at issue; 6th, making matters worse; 7th, *seriously* misquoting; 8th, making merry over my errors; 9th, favouring you with an uncalled-for and unsound analysis of an argument; 10th, introducing much foreign matter, &c., &c. Goodness gracious! if I were to attempt to answer all these charges I might fill a complete number of your Journal. I will only venture to reply to charge 7th. The word 'misquoting' may convey many meanings. It may mean malicious misquoting, or it may mean something milder. Here are the passages in dispute. Mr. Winstanley says:—'The idea of this continued action being one which is founded on no evidence serious refutation of it is a waste of time. The pursuit of science does not demand the controversion of ungrounded notions, for they are unworthy to be entertained. He who spends his time in such occupation but wastes his strength in razing structures which of themselves must fall.' I quote him as saying 'a notion is ungrounded and unworthy of being entertained.' Well, clearly Mr. Winstanley speaks of one who spends his time in some *occupation*. What occupation? The controversy of 'ungrounded notions' which 'are unworthy to be entertained.' What are 'ungrounded notions?' Those 'founded on no evidence.' Name one 'founded on no evidence:' the 'idea' in question. Practically this is what Mr. Winstanley says. Now, how far is my quotation (called a 'misquotation') from the truth? I fancy it would require all the ingenuity of a Philadelphia lawyer to make it out. Upon the rest of the charges each reader must form his own opinion. Should you extend your justice to me and insert this, my only remaining desire is, like an honourable combatant, to shake hands and let feeling be left dead on the field."

Received.—A. M'William; R. Ward & Co.; S. Fry; W. Vick.

Received for the Rejlander Fund.—"A Friend," 5s.; Messrs. Huggon and Co., Leeds, £2 2s.

## METEOROLOGICAL REPORT,

*For four Weeks ending July* 7, 1875.

Observations taken at 406, Strand, by J. H. Steward, Optician.

These Observations are Taken at 8.30 a.m.

| June. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 11 | 29·59 | W | 51 | 55 | 64 | 50 | Cloudy |
| 12 | 29·72 | SW | 51 | 56 | 61 | 50 | Cloudy |
| 14 | 29·59 | W | 56 | 60 | 64 | 54 | Cloudy |
| 15 | 29·47 | SW | 52 | 56 | 64 | 52 | Cloudy |
| 16 | 29·59 | W | 52 | 57 | 66 | 51 | Cloudy |
| 17 | 29·79 | W | 53 | 57 | 71 | 49 | Cloudy |
| 18 | 30·00 | NNW | 53 | 57 | 67 | 53 | Dull |
| 19 | 30·16 | E | 52 | 54 | 74 | 50 | Dull |
| 21 | 29·79 | E | 50 | 55 | 61 | 54 | Dull |
| 22 | 30·14 | NW | 53 | 55 | 75 | 48 | Dull |
| 23 | 30·19 | W | 57 | 61 | 71 | 53 | Cloudy |
| 24 | 30·26 | W | 55 | 61 | 75 | 55 | Cloudy |
| 25 | 30·10 | W | 56 | 59 | 77 | 56 | Dull |
| 26 | 29·95 | W | 56 | 60 | 73 | 56 | Dull |
| 28 | 29·84 | SSE | 56 | 58 | 67 | 55 | Raining |
| 29 | 29·85 | W | 58 | 59 | 73 | 57 | Dull |
| 30 | 29·86 | W | 56 | 61 | 67 | 57 | Cloudy |
| July. | | | | | | | |
| 1 | 29·74 | S | 61 | 62 | 67 | 60 | Raining |
| 2 | 29·73 | SW | 57 | 61 | 70 | 56 | Cloudy |
| 3 | 29·85 | N | 57 | 59 | 70 | 58 | Raining |
| 5 | 30·33 | NE | 52 | 57 | 71 | 49 | Cloudy |
| 6 | 30·32 | NE | 55 | 57 | 77 | 56 | Fine |
| 7 | 30·30 | E | 57 | 60 | — | 56 | Dull |

CONTENTS.

THE BRITISH
# JOURNAL OF PHOTOGRAPHY.

No. 793. Vol. XXII.—JULY 16, 1875.

## BLISTERS.

From the fact that our last two volumes contain very little on this once prolific subject of correspondence, it might be inferred that blisters had ceased to be the photographic *bête noir* they once were, or that photographers had discovered some means of either curing or preventing them. But we fear that no such good news can be recorded, and have reason to believe that printers are as much afflicted as ever with them, but that, having tried in succession each proposed remedy without any beneficial result, they have learned to endure with patience what, apparently, cannot be cured, and content themselves by trusting that the small blisters will settle down harmlessly on drying, and with throwing away the prints on which large ones appear.

This is not, however, the conclusion at which it is proper to arrive. It is quite evident that blisters must have a cause, and if we could only clearly make out what that actually is we should certainly be somewhat nearer to a successful remedy. Blisters are of various kinds, and may, and doubtless do, arise from various causes; but those to which we at present more specially allude are undoubtedly the most troublesome and, we think, also the most prevalent.

Usually they make their appearance towards the later stage of the washing operation—at first as minute points, which gradually increase in size until they are as large as medium shot. If they can be coaxed into remaining of this size no very great harm is done, as, generally speaking, they disappear on drying, and leave hardly a perceptible trace behind. But far more frequently they are not so easily got rid of; the little blisters gradually increase in size and ultimately run into each other, forming large patches sometimes several inches in diameter, in which the albumen and the paper have apparently parted company.

Our attention has been directed to this subject by receiving a visit from a friend a few days since. He is principally employed in the production of large work, and was fairly at his wits' end in consequence of the persistent recurrence of the type of blisters just mentioned. By way of illustration of the cause of his troubles he submitted for our inspection the work of the previous day, consisting of ten very fine large prints, six of which were utterly useless, each having from three to six patches, as large as crown pieces, in which it was quite evident that the albumen and its paper support had become separated, and that in drying they had contracted unequally. "I have no doubt," our friend said, "that everything in the Journal is of use to somebody, and probably most of the matter is interesting to all; but if you could give a little attention to such a thoroughly practical subject as this, and do even a little to lead to a remedy by which an occasional loss of sixty per cent. could be saved, you would earn the gratitude of every printer in the kingdom."

With a view to examining the subject to some extent, we asked for a detailed account of the *modus operandi* by which the prints were produced; and as from numerous inquiries we have since made the method may be taken as representative of much of the work that is now done, we here give a brief summary of our friend's mode of producing large pictures.

The paper is the best that can be procured, and although the product of any particular maker does not appear to be specially subject to the blistering, it may be taken as a rule that the smoother the surface of the albumen the more likely is the evil to occasionally appear. It is sensitised on a bath of thirty-five grains of nitrate of silver, and the same quantity of nitrate of ammonia or soda. The prints are washed in only two, or at most three, changes of water when taken out of the printing-frames, toned in a solution of acetate of soda and gold, and fixed for ten minutes in a twenty-five per cent. solution of hyposulphite of soda. The washing is done in a large porcelain vessel, and the water changed every ten minutes for three hours; the prints are then allowed to lie all night in the water, and in the morning another three hours' washing is given, in which the water is changed as frequently as in the evening. The blisters never make their appearance until the morning, or until after a rather prolonged soaking in water; and it is found that from the same quire of paper some sheets blister all over, while others show no trace of blistering.

On the insertion of the point of a knife between the albumen and paper at a blistered portion of the print the two were easily separated, and by the same means they separated readily even where no blister existed, showing that although the action of the water had not been sufficient to separate them, very little mechanical force was necssary to this operation. The separated parts were next subjected to microscopic observation, and it was at once evident that there had in reality been no separation between the paper and albumen; but the paper itself had been split, one thin film remaining firmly attached to the albumen, while the rest had come away. A still more careful examination seemed to show that the felted fibre of which the paper was composed had been torn asunder by a force much greater than the mere passing out and in of water or gases, as has elsewhere been suggested, could have exercised, thus restricting us to the belief that mechanical force in some form, and at some previous stage of the operations, was much more likely to be the true cause of these blisters.

What the mechanical force may have been we are not in a position to say, but would suggest that rolling the paper, as some makers advertise they do, may possibly account for it. It is a well-known fact that when a sheet of paper is subjected to heavy pressure between two rollers, or between a roller and a plate of metal, it is materially increased in superficial area, and of course the same thing will occur with an albumen film. Different samples of paper, and especially films of various kinds of material, have very different expansive powers, and it does not seem improbable that albumenised paper under heavy rolling pressure may, in consequence of that fact, be injuriously affected. If the paper expand more than the albumen, while, nevertheless, firmly attached to it, we think it not unlikely that there will be sufficient rending action to account for the ease with which, in some cases, the felting, in the case of blisters in question, had given way. This idea is somewhat borne out by the statement, which we have had pretty fully corroborated, that the smoothest paper—that is, that which had been subjected to the greatest pressure—was the most given to form large blisters, and also by some slight experimental tests to which we have subjected several samples during the past few days.

The only rolling apparatus to which at the time we had access was a small goldbeater's mill. Through this we passed several

strips of paper which we had been using for some time with successful results, and they, together with some which had not been rolled, were sensitised, printed, and washed, and in every case the rolled paper blistered more or less, while the unrolled paper washed and dried all right. We do not by any means mention this as a satisfactory test, as the rollers were not suited for the work, and the paper was certainly more severely injured than it would have been by any pressure albumenisers are in the habit of applying; but we are anxious to direct attention to what may turn out to be at least one cause of the serious affliction to which photographers are so frequently subjected.

Until the cause and cure of blistering are satisfactorily made out, we believe it would be well for photographers to seriously consider the propriety of materially shortening the time they allow their prints to lie in the water. Although thoroughly well known, it seems to be in practice almost as thoroughly forgotten, that it is to frequent changes of water, and not to long soaking, we must look for the elimination of the hypo. Ten changes in the course of one hour do much more good than a soaking of ten hours.

There is, probably, no better method of rapid washing than that adopted even by some who do a large amount of work; we refer to using only some dozen or so of changes, but taking care to roll on a plate of glass with a rubber or glass roller after each change. We are aware that this has been objected to in consequence of the time occupied; but this objection has really no foundation, especially if, instead of the glass plate and roller, an ordinary wringing-machine with two rubber rollers be used. This we have just tried. We washed fifteen 11 × 9 prints in three-quarters of an hour with twelve changes of water and twelve rollings, and the most delicate test for hypo. has failed to detect a single trace either in the last water or in a portion of one of the prints.

The only objection we found to the use of the wringer was a tendency, unless very great care be exercised, to somewhat crease the prints; but this tendency would not be found in a new machine that had not been injured by the passing of large articles through it. Of course if the article were to come into general use manufacturers would soon find it to their interest to make suitable machines in which the rollers would be perfectly true, and the fittings more suitable than those of the ordinary wringer. Until, however, that is done we are so well pleased with the use of the ordinary domestic article that we heartily recommend its use to all who appreciate rapid and thorough washing.

## TOURIST PHOTOGRAPHY.

We are now in the very height of the photographic season, and it only requires a few days of settled weather to bring into the field probably hundreds of amateurs who have not yet taken their annual holiday.

The pictures taken during the annual trip to Scotland or Wales, or to some other favourite resort, forms with many amateurs the whole of the work of a pictorial or interesting nature which he is able to turn out during the season, and hence the holiday becomes a matter of much importance—is planned, dreamt about, and rehearsed in all probability months before. The object, of course, is to get as much work done as possible in the limited time at the nomadic photographer's disposal, and nothing less than a dozen negatives *per diem* will satisfy him. Here he makes his first mistake, for there are very few localities where it is possible to find a dozen subjects really worth photographing each day for a week; while if such be found and secured it is at the cost of so much labour that the holiday element entirely disappears.

Another mistake made by some amateurs is that of attempting too much in a different direction. We recollect some years ago meeting at a favourite summer resort of photographers and artists a young gentleman who was working the wet process, and who dragged about with him wherever he went, in addition to his tent and other paraphernalia, *two* cameras and *eight or nine* different lenses. Strange to say, instead of turning out a large number of pictures he came at last to be satisfied if he secured one a day.

It is to be borne in mind that photography as a recreation is very different from the same followed professionally. The object in either case is respectively pleasure or money, and if from any cause the object is not attained the amateur is as much a loser as if he had sustained pecuniary loss, just as in the case of the professional photographer.

It behoves the amateur, therefore, not to attempt too great things; to let his apparatus be simple but at the same time comprehensive in its uses, and to be content with its capabilities without stretching them. It is ridiculous to suppose that in one short fortnight any man can possibly fill his plate-boxes with negatives—very likely ranging in size from stereoscopic to 12 × 10—without, on the one hand, acquiring a great deal of pictorial rubbish, and, on the other, knocking himself up completely by overwork. It is, however, quite possible, by going systematically to work, to bring home from a fortnight's tour at least four or five dozen negatives of far better quality than the chance successes of the twelve-per-day amateur, and to allow time besides for enjoying the fresh air and scenery.

For tourist purposes it is decidedly injudicious to work large plates, not only on acccount of their weight and the expense entailed thereby in porterage and attendance, but because, by rendering the photographer unwilling to move any distance from his hotel or conveyance, they cut him off from the out-of-the-way nooks and corners which frequently form the best subjects. We should certainly advise any intending tourist to limit the size of his plates to that known as "cabinet" or, at the very extreme, to 8½ × 6½. If this be done the camera, lenses, and plates may all be carried in an ordinary knapsack, and if a folding tripod be added this may be strapped on the knapsack, the whole being carried on the shoulders—a style which is less fatiguing and troublesome than the old hand-bag, besides leaving both hands free for climbing or other purposes. This is in itself a very small matter, but it is surprising how great a difference it makes in one's feelings after a day's tramp. We will undertake to say that those who have tried the knapsack plan will scarcely change it for any other.

In preparing for a photographic tour the first labour is in the preparation of the plates. This in the old days was really a "trouble," and required not only a great deal of time but an infinite amount of care. This is all changed now, for by using any of the emulsion processes a few hours' work and a corresponding amount of care will suffice for the preparation of all the plates required for a month's journey. It is needless here to recommend any particular process as being better than another; each of our readers doubtless has his own favourite. Whatever process be employed the plates should be prepared with the most scrupulous care, and those rejected which possess the slightest defect. Far better is it to thus reject defective plates than to find upon your return home that your favourite subject—the one you most particularly desired to secure—is marred or perhaps totally spoilt by a speck in the collodion, a flaw or irregularity on the film, or an accidental stain—defects which, in the hurry of preparing a large number of plates, were passed over as insignificant.

In order to secure uniformity and freedom from defects we would give a few words of advice. In the first place we should recommend the invariable use of a substratum, preferably of albumen. This saves much trouble in polishing the glass, and at the same time produces a more reliable surface upon which to work as well as making the picture adhere to the glass. A word of caution to those who albumenise their plates some time before use:—Always apply heat shortly before coating with collodion in order to drive off the moisture which invariably attacks the albumen surface. The neglect of this precaution is doubtless the most common cause of blisters and stains during development.

Another precaution to be observed is the *careful* dusting of each plate previous to coating. We emphasise the adjective, because though we imagine few even of the most careless operators fail to pass a brush over the surface of the plate before applying the collodion, yet there may be some who are not aware of the tenacity with which dust and filaments of cotton, &c., adhere to the glass in spite of the brush, each forming the nucleus of a thickening of the

film when the plate is coated. Of course the collodion or emulsion is blamed for this result and is set aside for re-filtration; but if a little more care were exercised in the simple operation of dusting there would be much less need for the more troublesome filtration of collodion.

It is, of course, of importance—more especially in the latter case—that the collodion or emulsion be properly filtered before use, when, if due precautions be taken, it will be unnecessary to repeat the operation. In coating a plate with emulsion the surplus should not be returned to the same bottle, but should be, as has been frequently recommended before, poured into a second one kept in readiness. By this means, if by chance a speck of dust or a filament of cotton be left on the plate, it goes into the second bottle instead of being poured backwards and forwards between the bottle and the plate, leaving streaks of unevenness behind it, until at last it is left high and dry in the centre of an otherwise satisfactory film. There is also greater uniformity in the thickness of the films, as that portion of the emulsion which has suffered partial evaporation is kept separate until it is necessary to thin it down to its original density.

It is advisable, more especially in emulsion work, to avoid as much as possible the constant corking and uncorking of the collodion bottle. A very good plan in preparing a number of plates—and one which is made use of by many well-known emulsion workers—is to form a rough cap of brown paper by pressing a small piece of that material over the neck of the bottle. It will retain the shape thus given it sufficiently to keep out dust while the bottle is not in use, and to prevent evaporation of it be necessary to leave the bottle standing for some minutes. There is then no chance of detached particles of the dried or half-dried emulsion being loosened by the cork and deposited upon the plate in the shape of "comets."

Those who employ the washed emulsion process are fortunate in not requiring to take any very great precautions for the prevention of spots caused by dust after coating the plate. To those, however, who still adhere to the bath or old emulsion processes we should recommend that, after the plates have soaked for the necessary time in water, the washing be completed by a slight rinsing from a tap or jug, in order to remove any matter accidentally adherent to the surface. Plates prepared with the bath, or emulsion plates containing free silver, should be first washed in distilled water and then transferred to ordinary water. If distilled water be not obtainable, ordinary water slightly acidified with nitric acid may be used instead. In applying the preservative, if the plate be allowed to soak in a dish—which is the usual plan adopted—it should, previous to draining, be flooded with a fresh and newly-filtered portion of the solution, which must be re-filtered before used a second time. This will remove any dust which may settle on the surface of the preservative, and from thence become attached to the plate.

The only precautions necessary in drying the plates are to avoid dust and draughts; and no special directions are necessary on those points, as each operator will understand best how to secure immunity from these two evils under his own peculiar circumstances. A discussion has recently occurred as to whether it is necessary to "back" dry plates or not. It has been stated that for ordinary views it may be dispensed with; and with this opinion we, to a certain extent, agree. But in the case of an amateur who wishes to equip himself for all descriptions of work, and who knows not what class of subject he may meet with, we should say, decidedly, "employ the backing." There is no necessity to plaster it on to the extent some operators do, for a very thin coating is sufficient, and the thinner the coat the less chance is there of its rubbing off and causing spots. The great aim in making a mixture for backing plates is to secure such proportions of colouring matter and gummy or hygroscopic substances as to render the backing easily removable before development, and, at the same time, not liable to become dusty on the one hand or tacky on the other. An excellent mixture employed by us consists of burnt sienna (ground in water) with sugar or treacle and gum arabic. It is impossible to give the quantities, as the proportion of treacle and gum will vary according to temperature and the state of the atmosphere. It is, however, a matter of the greatest ease in practice to secure the proper conditions.

The plates backed and dried should be carefully dusted and packed away. This is done preferably by packing them in twos, face to face, with a thin piece of cardboard between the corners to prevent contact, the pairs being made up into packets of a dozen plates and securely wrapped in brown paper. They will thus occupy less space than if stored in plate-boxes, and will be less liable to the action of dust and moisture.

"These are very trivial matters," we imagine some of our readers may say; but it is attention to these little matters of detail which ensures success. What is the value of an artistic picture if it be ruined by spots, stains, and other blemishes? It is a matter of ease to prepare a single plate without defects; but when four or five dozen have to be got through in a very short time it becomes specially necessary to look to the details.

We have already occupied so much space that we shall be compelled to leave over our remarks upon the exposure, development, and other manipulations until a future time.

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Mr. M. Carey Lea has recently spoken of the importance of using fused silver nitrate for the purpose of sensitising emulsions. This necessity, as he explains, does not arise from any intentional adulteration of the silver nitrate usually obtainable, but principally from the accidental presence of water, either absorbed from the atmosphere or held mechanically by the crystals. The pulverisation and subsequent drying by means of heat or otherwise of the powder is far from being a satisfactory way out of the difficulty, as the powder absorbs moisture and other impurities with much greater rapidity than the crystals. The fused nitrate of commerce is frequently contaminated with traces of iron, in addition to its being about one-third more expensive than the crystals—two facts which combine to prevent its general use—while to fuse the crystals himself is more than the average amateur cares to undertake. It is not, however, so difficult a matter as may be imagined by some; we have frequently performed the operation with no other appliances than are usually found in a photographic laboratory. We do not, as a rule, recommend the home manufacture of silver nitrate; but in our own case we find it a convenient means of getting rid of our residues. We take of nitric acid (s.g. 1·45) one part, of silver and water each one and a-half part, and dissolve by means of gentle heat in a glass flask. When the whole of the silver is dissolved a small quantity of the solution is poured into a test glass, and precipitated with carbonate of soda and carbonate of silver thoroughly washed. This is then stirred into the bulk of the solution until the whole of the acid is neutralised, or until a very small quantity of the carbonate remains undissolved. The solution is then filtered clear and evaporated as may be most convenient. We usually leave it in a sand bath for some hours until perfectly dry. It is then redissolved in the smallest possible quantity of distilled water, and transferred to a small Berlin porcelain capsule or dish, and again dried by means of a spirit lamp or Bunsen's burner. The heat is then cautiously raised until fusion takes place, when it may be poured on to a porcelain slab to cool. It is then broken into small pieces, and must be kept in a closely-stoppered bottle. The operation is one of the greatest simplicity, and, if ordinary care be exercised, the product is as pure as can be obtained. We prefer to pulverise it when required, though that is scarcely necessary in sensitising what is intended as a washed emulsion.

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## METHYLAL.

During the past two or three months mention has on several occasions been made in the photographic journals of an alleged shortening of the exposure in the camera by means of a certain addition to the developer. It promised so well that I considered it my duty to try it for my own satisfaction. At first I met only with failure in consequence of the contradictory and erroneous descriptions of the substance employed; but the last and most detailed formula published afforded me an opportunity of forming a more definite opinion, and the result of my observations and experiments I now communicate to your readers.

In my experiments I followed the formula given in this paper, viz. :—

| | |
|---|---|
| Sulphuric acid | 3 parts. |
| Water | 2 ,, |
| Wood naphtha | 2 ,, |
| Peroxide of manganese | 3 ,, |

These were put into a glass retort and distilled over a very slow fire until the distillate amounted to three-fourths of the quantity of naphtha used. The liquid obtained was colourless, and of a strong but not unpleasant ethereal odour.

A solution was then prepared in the following proportions:—

| | |
|---|---|
| Protosulphate of iron | 15 grains. |
| Water | 1 ounce. |

One portion of this was acidified with fifteen grains per ounce of glacial acetic acid, while to another portion was added five per cent. of the new distillate.

A glass plate prepared in the usual way was, after exposure, cut in two, and one half was developed with the aceto-iron developer, the other half being developed with the new developer. After careful examination of several negatives obtained in the way described I came to the conclusion that the new developer is *superior* to the old one, and in the following points :—

1. It shortened the exposure, although not to such an extent as was originally claimed; still so as to be quite plainly discovered on every negative, but most distinctly on those which had received the shortest exposure.

2. The new developer does not require any addition of alcohol to cause it to flow smoothly, and thus prevent the formation of streaky or greasy lines. It is astonishing how small a quantity of methylal confers upon the developer the property of flowing uniformly on the collodion surface.

3. With the new developer not only does the image appear quicker, but the development can be prolonged to a greater extent without the danger of fogging, thus permitting us to secure more detail while preserving perfect clearness.

4. Since preparing the new developer, now one month ago, it has remained perfectly colourless; while a developer made at the same time with acetic acid is already of a brown colour. This speaks in favour of its keeping qualities.

From the short experience I have had with this new developer I am so well pleased with it that I have decided not to use any other in my wet-process practice. The formula stands thus :—

| | |
|---|---|
| Protosulphate of iron | 1 ounce. |
| Water | 4 ounces. |
| Methylal | 2 ,, |

Now, as to the name and symbol of the new substance. It is known to the chemist by the name of "methylal." On the authority of Pelouse and Frémy methylal has for its symbol—

$C^6\ H^8\ O^4$

| | |
|---|---|
| $C^6$ | 450·00 |
| $H^8$ | 100·00 |
| $O^4$ | 400·00 |
| | 950·00 |

It is soluble in water, alcohol, ether, and wood naphtha; its boiling point is 42° Cent. or 107·6° Fahr.; its density is 1·855. The alcoholic solution of potassa converts methylal into the formiate, and chlorine converts it into the sesquichloride of carbon, $C^4\ Cl^6$.

Methylal may be considered as three equivalents of methylic ether, in one equivalent of which an equivalent of oxygen replaces one of hydrogen; or it can be assimilated to acetal, and considered as two equivalents of methylic ether and one of methylic aldehyde.

L. Warnerke.

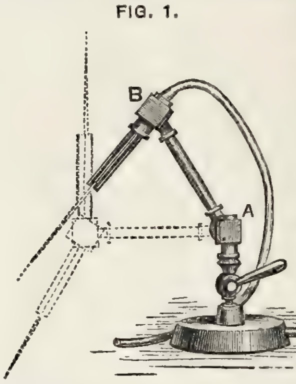
## ON THE USE OF PHOTOGRAPHIC AND CHEMICAL APPARATUS.

### CHAP. XII.—CUTTING, DRILLING, AND WORKING GLASS—*(Continued)*.

For operations requiring the heat of a lamp or gas burner it is well worth while to have one or two simple utensils at hand to facilitate the neat execution of the work. For instance: the three-cornered file already mentioned, a few pieces of charcoal of various sizes, and a small cone-shaped piece of iron will each in its place be very useful.

As to the lamp, that must depend upon the student's means. An ordinary gas flame and a Bunsen's burner will supply most wants; but a Herepath's jet is such an extremely useful help that its acquisition is most desirable. This is, in effect, a blowpipe. It consists of a heavy stand from which rises a tube to carry the gas, which is connected to it at the base in the usual manner; from the upright tube there branches another, which can be made to assume either a horizontal or vertical position, and within it is permanently fixed a blowpipe, the mouth end having attached to it a small piece of india-rubber tubing, and the other end a blowpipe jet at a short distance from the orifice of the outer tube. When the gas is turned on and lighted it gives a smoky, uneven flame until the blowpipe is used; but the moment that is called in to help, the flame changes to the blue, hot, smokeless one so familiar with the Bunsen burner, requiring no skill to give it the requisite characteristics of the perfect blowpipe flame. If, also, a blowing apparatus be provided a most luxurious instrument will be always at hand; the Fletcher's blower, alluded to in an earlier chapter, is, perhaps, the most economical of any. Mr. Fletcher has also made a modification of the Herepath's jet, combining still greater powers of adjustment with the ordinary usefulness of the instrument. By means of the joints at A B the jet can be pointed in any direction, the dotted lines showing positions indicating the great range it possesses. It is the form chosen for illustration, as it embraces all the principles of the ordinary form.

FIG. 1.




In using the Herepath's jet it is important to regulate the supply of gas to air to obtain the right shape and character of flame, which it is assumed the student is acquainted with—the outer or oxidising flame being separated from the inner or reducing flame with the utmost sharpness.

In all operations with tubes the hand requires more education than the eye. The state of the glass when melting can generally be better ascertained from the way it gives to the hand than from its appearance to the eye. It is desirable to practice with a few odd pieces of tube till some amount of steadiness is obtained. Thus, a piece of tube heated at a flame till soft, and then rotated in the hand, should be held without either stretching it or allowing it to become bent in any manner. When manual dexterity to this extent is attained the operator may safely trust himself to do all the glass working that he will need.

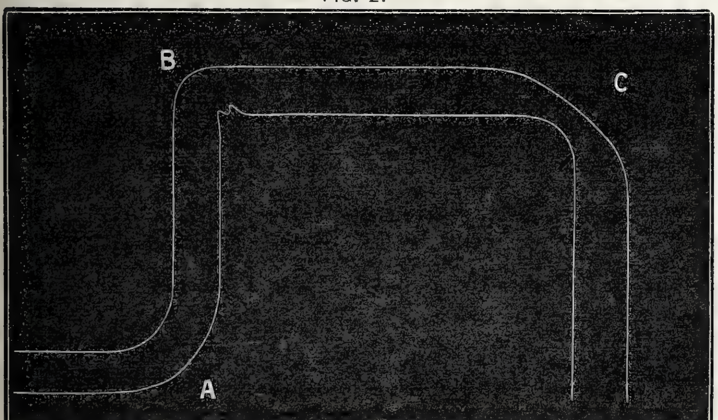
*Bending Tubes.*—This first operation likely to be required by the young student is the easiest he can perform, yet it affords plenty of scope for showing the difference between good and bad workmanship. The greater the diameter of the tube the more difficult it is to work it; and the difficulty increases with the thinness of the glass. The white glass containing lead is the easiest to bend from the lower temperature at which it melts or softens, and it will answer for all ordinary purposes. It is, however, acted upon by some chemicals, and is liable to become coated with a black film (if not properly managed) from the reduction of the lead to the metallic state. The green glass requires a much greater heat, and is, therefore, more difficult to work; but it is not liable to become discoloured in working, and is also acted upon by fewer chemicals than the white. A thick body of flame is requisite for making a good bend. A small-sized Bunsen burner is scarcely suitable; indeed, a common fish-tail jet is to be preferred to it if white glass be used. Two Bunsen's burners together give a pretty good flame; also a spirit lamp with the strands of the wick well spread out. If nothing but a Bunsen burner be at hand the flame can be extended a little by turning on the gas to the fullest and holding (by means of a retort-stand) a piece of fine gauze about an inch above it, lighting the gas above the gauze. But the best flame for the purpose is a solid flame, such as would be produced by placing a metallic cylinder over an Argand burner, covering the cylinder top with gauze, and lighting the gas as it issues from the gauze. Such burners are to be obtained from the dealers; but it is quite easy to extemporise one. A tinsmith would bend a piece of sheet iron into shape in a moment, and the gauze requires no fastening. A piece simply placed on the top and bent over so as to overlap for about an inch all round is sufficient.

A little preliminary advice, which is applicable to all operations with glass, may be given at this stage. It is necessary in almost every case to apply heat in a gradual manner, or otherwise a fracture would result owing to the sudden unequal expansion. With thin glass only will it be found that the sudden application of heat is productive of no ill effect, while with glass of much substance the greatest care will be needed. The object is not to be placed in the flame at once, but is to be held some distance in advance, the hot air giving quite sufficient heat; it should then, when judged to be heated throughout, be brought slowly to the flame, the tip of which is the hottest part, and, in flames such as those given by a common

gas-burner, or in any flame where the gas is not wholly consumed, it is the only part to be used. If, however, with such a flame the object before becoming red hot is brought within the luminous part, a deposit of soot will be produced upon the tube, and will then reduce the lead oxide of the glass and form a very dirty-looking patch; but this, if noticed in time while it is on the surface, and before it is incorporated in the body of the glass, can be removed by placing it just at the tip or edge of the flame, when the metallic film will again be brought into the colourless state. When the object has been brought to the required form still greater precautions are requisite in cooling than in heating, so that it may become properly *annealed.* This process merely consists in allowing the glass to cool very slowly—the thicker it is the more slowly. If it were allowed to cool too rapidly it would become too brittle—in some cases so much so as to be useless—and the slightest touch would break it. It should, therefore, be slowly drawn away from the flame, and then held, for a length of time dependent upon its thickness, in such a position that the heated air may play upon it at a gradually-increasing distance, when it may be put aside in a warm place till quite cool, with the heated part kept free from contact with any cold object, or any piece of wood work, such as a table, for the latter would cause a permanent stain. In the case of a glass tube the heat needs to be more cautiously applied to the end than to any other part; a degree of heat which would be quite safe when applied to the middle of a tube would shiver it to fragments at the end.

A piece of tube of suitable thickness having been selected and marked with chalk at the place where it is required to be bent, it should be gradually heated, first holding it above the flame, and then gradually lowering it, till it is entirely surrounded by the upper part of the flame. The heat should not be confined to one spot, but a space of about an inch should be evenly heated, the tube being rotated on its axis all the while. As soon as it is sufficiently softened to give to a gentle pressure it should be carefully bent to a slight angle, *pointing the tube ends upward,* and then the flame played upon it for a short distance on one side beyond the heated part. When this is heated another increase to the curvature may be given, bending it little by little, and so on till the required angle is obtained. If the operation be performed opposite a window the framework is a good guide when the angle required is a right angle. Care must be taken to keep the tube straight—that is, the two legs in one plane. This can be seen by holding it up and looking sideways at it; the slightest deviation will then be perceived. If it be heated too much, and so made too soft, the bend will collapse and flatten at the outside (see C, *fig.* 2)—a result similar to that which

FIG. 2.




is produced when using too small a source of heat. If the bend be made too suddenly the curve will be uneven, the inside bend generally rising at the bend in the form of a ridge or wrinkle (see B); A shows a perfect bend. If the curve have to be made near the end of the tube it will be too hot for the fingers to handle the short end. A piece of wood with a blunt point may then be used to assist in obtaining the requisite pressure; or, if the heat have to be applied quite to the end, a piece of cold iron of suitable shape will be needed, as the wood would stain. But the iron must be applied cold and while the glass is soft; for if the iron got red hot it would adhere to the glass, and if the glass cooled too much when in contact with the iron it would crack.

Considerable difficulty will be experienced in bending tubes of thin glass when of a large bore. One method of avoiding the difficulty is to close one end and blow gently into the other as the bending proceeds; but the easiest plan is to first fill the tube with clean, *well-dried* sand and then perform the bending, taking care to use the minimum degree of heat to prevent the sand adhering to the glass. It is scarcely necessary to state that an accident would result if the sand were not dry. The source of heat should be well diffused.

G. Watmough Webster, F.C.S.

## NEW METHOD OF COLOURING AND MOUNTING PHOTOGRAPHIC PICTURES.

This invention, which has been provisionally patented by Adolphe Henri Braun, of Paris, is intended to supply an improved method for producing coloured photographic pictures which, it is said, can scarcely be distinguished from the most highly-finished oil paintings, and which may be obtained at a comparatively small expense of time and labour.

A carbon photographic print is obtained in the usual manner, but using for its support instead of the ordinary transfer paper, which is a tolerably stout white or tinted paper, M. Braun makes use of a very thin, semi-transparent paper of the kind known as "*papièr vegetal,*" to which the carbon print is transferred in the usual way. The back of this print is then coloured with either oil or water colours, or by means of chromolithography. For this purpose a very moderate amount of care only is required, the half-tones and shadows being produced by the photographic picture. By means of glue or other suitable cement the coloured picture is then mounted upon canvas, cloth, or other material upon which oil paintings are painted, after which such retouching or corrections are made on the front as may be necessary, when it is to be varnished with the usual varnish.

The feature of novelty claimed by the patentee relates more particularly to the use of semi-transparent paper as a support for the carbon picture, and the mounting of such picture when coloured on canvas or other suitable material which will produce a picture in imitation of an oil painting.

## FOREIGN NOTES AND NEWS.

Colonel Woodward's Photomicrographs at the Vienna Exhibition.—Professor C. Himes' Method of Developing by Daylight.—Dr. Monckhoven's Retouching Varnish.—New Method of Making Formic Acid.—The Influence of Coloured Rays.—A New Lens by M. Berthiot.

It may not, perhaps, be considered out of place to call attention to Colonel Woodward's splendid collection of photomicrographs now on view at the Vienna exhibition. Unlike other microscopists Colonel Woodward uses no camera, but works in a darkened room, so that nothing comes between the slide and the objective. In the course of his experiments he has tried all sorts of lights—sun light, lime light, electric light, and magnesium light; and, unlike M. Girard in this, also, he prefers the light of the sun to any artificial light; but this preference only dates from the time when he succeeded in modifying it so as to give results similar to those produced by the lime and electric lights with which he used to obtain the best results. Besides, under the almost cloudless sky of Washington the sun gives by far the cheapest light and is far more to be depended on than here.

For using the magnesium light Woodward has contrived a way of obviating the disagreeable magnesium fumes. He furnishes the short chimney of the box in which the magnesium is burnt with a continuation of wire wound in a spiral form, wraps coarse net round the wire spiral, and allows the net covering to terminate in a wide bag. The current of air escapes through the holes of the gauze, while the cooled oxide and magnesium collect inside the gauze cover and bag.

Colonel Woodward's enlargements run up the whole scale of size to 2,400 times that of the original. Amongst the specimens shown are the *Pleurosigma angulatum* and *formosum* in various scales, and other pictures giving a glimpse into the construction of diatoms, &c.

In a communication to the *Photographisches Archiv,* Dr. Charles Himes calls attention to an article of his, which appeared in 1865, on a subject which has just cropped up again, viz., *Sensitising and Desensitising Substances.* In the article in question Dr. Himes described a method of developing pictures in broad daylight which agrees in its fundamental points, though not in its details, with that described by Krone in the *Photographische Correspondenz* some years later. Dr. Himes says that though the process he published had been well tested both by himself and others it did not take, because the principles on which it is based are quite contrary to all photographic instincts. He found that a number of substances

which are constantly in the hands of photographers—especially the combinations of chlorine, bromine, and iodine—not only make iodide and bromide of silver insensitive to light, but also suspend the development of all light action. He proceeds as follows:—

First he sensitises the plate with certain substances—chief amongst which are tannin and nitrate of silver. Then he coats the plate with ordinary negative collodion containing iodide and bromide of silver, immerses it in the silver bath in the full light of day, washes the silver solution well off, pours repeatedly over it a solution containing five per cent. of iodide of potassium, and finally washes it well with water again. After plates so treated are dried (Dr. Himes says), they can be kept for a long time without injury either from the air or damp. But this is not all; for he found, subsequently, that even the wash of iodide of potassium could be dispensed with, and that all traces of the action of the light were removed when the plate was washed with water for at least an hour, and then set directly in the sunshine.

Dr. Himes contends that his method is superior to Krone's, in so far as that Krone uses uncommon chemicals, while in his (Dr. Himes') method well-known and commonly-used solutions and formulæ are brought into play. That by his method the effects of the action of the light which has already taken place are removed, while by Krone's method they are prevented, thus reversing the usual application of the proverb, which says—"Prevention is better than cure." He holds, further, that Krone attributes too much importance to the direct photo-chemical action of the light upon the bromide of silver, and overlooks the fact that this action is either prevented or removed by the desensitiser.

The sensitising solution usually employed by Dr. Himes is one part of tannin dissolved in thirty parts of water. After the plate has been completely wetted with distilled water this tannin is either poured on to the plate, or else the plate is dipped into it for half-a-minute. This is done in the dark room. The developer may be the ordinary pyrogallic acid and nitrate of silver one. The water required to cover the plate should always have a few drops of a solution of five grammes of pyrogallic acid in thirty cubic centimetres of alcohol added to it, to which later, as required, a few drops of a solution of fifteen grammes of nitrate of silver and two grammes of citric acid in thirty cubic centimetres of water are added.

The following formula for a retouching varnish is given by Dr. van Monckhoven:—To a saturated solution of carbonate of ammonia add shellac, and allow it to rest for twenty-four hours. The clear portion is then decanted and mixed with an equal quantity of water and the mixture boiled, stirring it during the operation with a glass rod. The proportions are eight parts of shellac to one hundred of the solution. Two successive coats of this varnish are applied to the plate after washing and draining, and, when dry, it gives a brilliant surface well adapted for retouching.

M. Lorm has succeeded in producing formic acid in a much higher state of concentration than has hitherto been possible by the old process. The method of M. Lorm depends upon the action of dehydrated oxalic acid upon a polyatomic alcohol or other suitable substance. We extract the following details of the process from a communication made by M. Lorm to the French Academy of Sciences:—Into a rather large tubulated retort introduce a quantity of glycerine; dehydrated oxalic acid in fine powder is now added and the temperature raised to about eighty-seven degrees, taking care not to exceed one hundred degrees. When the decomposition appears to be sluggish more oxalic acid may be added. The formic acid thus produced is purified by distillation, and is then obtained perfectly free from any impurity and of the strength of about ninety-four per cent. It is of the greatest importance that the oxalic acid be thoroughly dehydrated.

M. D. de Clercq has communicated to the Belgian Photographic Association a lengthy note on *The Influence of the Coloured Rays Upon the Tone of Positive Proofs*. M. Clercq has experimented with various-coloured pellicles placed in front of the negative, and we gather as the result of his experience that each different-coloured ray gives a positive print of a different tone, the exposures in all cases being the same. The author deduces from these results that it is the *colour* of the rays which produces the effect; but we have little hesitation in saying that similar effects may be produced by different shades of the same colour—that, in fact, the different tints depend upon the proportionate obstruction which the light suffers. M. Clercq tells us, as a further result of his experiments, that "of all the tints blue was the most actinic, and orange the least so," innocently adding—"a result it was easy to foresee."

M. Berthiot, the optician, of Paris, is about to construct a lens for special use in connection with the heliochromic process of M. Ducos du Hauron. His researches on the conditions under which the coloured glasses should be used to produce the best results have been entirely successful. He has found the best position to be immediately behind the anterior lens. M. Berthiot has also discovered an easy and economical method by which the coloured plates may be made with perfectly parallel surfaces—a state of things not easily attained previously.

## DEVELOPMENT.

Your article on *Development* is of value to dry-plate workers, and there is one point in it which I wish to strengthen as much as possible. You, in writing of continued development, recommend the addition of pyrogallic acid with each addition of ammonia, and show your sense of its importance by putting the words "and pyro." in italics. I am sure many plates are spoilt from neglect of this precaution, and I ask leave to repeat a sentence from a paper on *Development* read by me before the Photographic Society last year. (See The British Journal of Photography, June 19, 1874, p. 290):—

"I find that dry-plate workers, whether using a weak or a strong alkaline developer, have not given sufficient consideration to the fact that, where a negative requires an extra dose or two of ammonia to bring it out, it is most desirable, if not indeed necessary, that a drop or two of strong pyrogallic acid solution should be added with each addition of ammonia. The reason of this would appear to be that the original amount of pyrogallic acid used with the developer becomes exhausted, and the added ammonia, having then no pyrogallic acid to assist its work, only produces surface-fog instead of continuing to develope the negative."

Correspondence with many friends has convinced me that hitherto this point has been much overlooked, and I am glad you have called renewed attention to it.

I read with much interest lately your articles on iron development. You did not in them allude to the following fact, to which I call your attention, viz., if the acids in the developer are replaced by glycocoll a very much finer deposit is obtained than with the developer in which acid is used. I have had this forcibly brought before me of late, as, owing to the extra rapid working of my bath when nitrate of uranium is added to it, I use slightly more restraining material in my developer, and then much prefer the addition of glycocoll to increasing the amount of acid. I send you a $24 \times 18$ negative to see, sensitised in a uranium and silver bath—twenty-two seconds' exposure with landscape lens of thirty inches focus—taken in my very dimly-lighted studio; and I think you will notice how fine a deposit and how delicate gradations are obtained by this method of working.

H. Stuart Wortley.

[The advantage of replacing the acid in the developer by glycocoll has long been recognised by us, and formed the subject of several articles about ten years ago, when we took occasion to urge upon photographers the value of that particular contribution out of the numerous additions made to our photographic resources by Mr. M. Carey Lea. In our volume for 1865 are several articles bearing on the strength and brightness of the negatives obtained by its aid, to the fineness and blackness of the deposited silver, to the anti-fogging properties it confers upon the developer, and finally to the advantages it possesses, as concisely expressed by Mr. Lea in an article in our issue for August 18, 1865 (page 429), when he says:—"The advantages which I attribute to this developer are, that with a shorter exposure an equally good picture may be got. But, what is much better yet, with an equal exposure a picture is got equally brilliant with that brought out by an ordinary developer, *but with more detail in the shadows*." The large negative forwarded to us by Colonel Wortley quite bears out this statement. Glycocoll, or glycocine, we may inform our younger readers, is obtained by the action of cold concentrated sulphuric acid upon gelatine, as well as by other methods. Full directions for its preparation and use will be found in the volume alluded to, in which we gave it the designation of the "ferrogelatine developer."—Eds.]

## MAJOR RUSSELL.

There are so many phases of experimental action in the researches of Major Russell as to render it not a little difficult to treat them fully and in proper sequence within the compass of a single article. But those which have stamped their impress upon every dry process in use at the present time, namely, alkaline development in its application to every process, and also that which lays claim to an equal degree of importance, viz., the substitution of bromide for iodide of silver in the preparation of a sensitive film, demand our

first attention. By way of prolegomena to the notice of these revolutionary discoveries, by which the whole tone of modern dry-plate photography has been changed, it is desirable and appropriate to say a few words with respect to the gallant author of these and other important discoveries and inventions.

Major Russell is a private gentleman of independent means residing near Romford. He was born in 1820, at Upminster Hall, in Essex, and is a scion of a family settled in that county for about two hundred years, and claiming lineage with Henry VII. (see Burke's *Royal Descents).* His family name of Branfill has been changed for that of Russell in obedience to the provisions of a will of the last of a neighbouring and nearly-related branch of the Russell family.

Major Russell was educated at Trinity College, Cambridge, where he took the degree of M.A. Neither his physical nor geographical studies appear to have been neglected; for it is certain that he won the Wingfield sculls on the Thames in 1846, while three years later he crossed the Atlantic, and devoted sixteen months to a tour through Canada and the United States of America. He is a magistrate and deputy lieutenant of Essex, and in 1859 was High Sheriff of the county. In 1852 he joined the West Essex Militia, and in 1855 received the appointment of major in that regiment. During the intervening period between the latter year and the present time he has continued to fulfil, with characteristic ardour, the patriotic duties connected with the position of a field officer in this branch of the auxiliary forces.

MAJOR RUSSELL,

FROM A PHOTOGRAPH BY THE LATE O. G. REJLANDER.

So much for matters of a purely personal nature. Those who have come into contact with Major Russell know him to be a man of upright, straightforward, uncompromising personal bearing, who to the enthusiastic prosecution of his favourite scientific pursuits has added—possessing, as he does, "right lusty sinews"—a thorough enjoyment of those congenial field sports which befit the position or inclination of an English country gentleman—"one of the olden time!"

It was after listening to a lecture by Mr. Pepper, at the Royal Polytechnic Institution, that Major Russell's attention was first specially directed to photography, this lecture prompting him to take lessons in our art-science so as to become acquainted with its practical details. Early in 1856 he discovered that the then popular and well-known Taupenôt, or collodio-albumen process had a canker worm at its heart—a fact of the existence of which every collodio-albumen worker is now but too well aware. It was this: While yielding negatives perfect as respects gradation and detail, plates prepared by this beautiful process rapidly lost their excellence after preparation, and did not keep well either before or after exposure in the camera. The drawback in this case was serious, and, unless obviated, one of the most valuable processes ever given to the photographic public must assuredly be lost Who would save it? At this juncture Major Russell stepped forward and said virtually, although not in such plain language as we now employ—"I recognise and appreciate the drawback, and have experienced to the full all the evils of this process. I have made this matter the subject of experiment, and have discovered the means of ridding you of the inherent evils of the process."

*How* he discovered it we cannot tell, but from the records of photographic progress we are assured that at a date two and a-half years anterior to July 15, 1858, Major Russell had recognised the shortcoming alluded to, and had provided a remedy—one the potency of which is recognised even at the present time in its application not only to the Taupenôt but to all other forms in which the collodio-albumen process is practised at the present time. What collodio-albumen worker is not aware that if he want his plates to keep, or to yield vigorous images, a preliminary wash of gallic acid is an essential requisite? This discovery we owe to Major Russell, and we thank him most cordially and most heartily for publishing it. It is true that some may consider it a small thing; but those who do so cannot adequately appreciate the position from which Major Russell rescued them, the steps and experiments by which the remedy was discovered, nor the great excellence of the remedy itself, exceedingly simple though it be. A simple final wash of an aqueous solution of gallic acid! Could not any person have discovered that? Yes, they could, but they did not. Major Russell did so; and we give him our heartiest thanks both for his discovery and for the generosity with which he presented it to the photographic public. As soon as he saw that he could give information likely to be of benefit to that public he did so. In every collodio-albumen process—whether it be the Taupenôt, the Fothergill, or the Ryley hot-water method—this final wash of gallic acid is now a recognised necessity. To Major Russell let the merit of its discovery and spontaneous revelation be freely awarded.

The tannin process has been so inseparably connected with the name of the subject of our sketch as to render it almost unnecessary to require special allusion to it in this article. When a committee of the South London Photographic Society gave, in May, 1861, their report of this process, Mr. Sebastian Davis said that "the simplicity and readiness with which the latent image can be developed commends itself to a full experimental consideration." This, indeed, is the first thing that strikes one. The image developes with marvellous rapidity. The image is good, and the details excellent; "'tis true 'tis pity, and pity 'tis 'tis true," that such a long exposure is requisite. Why should not a dry plate be quite as sensitive as a wet one? This brings us a step farther forward in Major Russell's career of discovery. It was not long before he found that bromide of silver possessed greater sensitiveness than the iodide, and this culminated in a discovery that lies at the foundation of all our emulsion processes. Previous, however, to alluding to this important fact we must take a short retrospective glance and speak of alkaline development.

The now well-known tannin process was introduced by Major Russell in 1861, and immediately secured a large measure of celebrity. The operations were very simple, the plates fairly sensitive, and the results unsurpassed. But the degree of sensitiveness attained did not come up to the expectations of Major Russell, who, after numerous experiments, eventually concluded that in the struggle of dry *versus* wet plates as regards sensitiveness a bromised film must be used for the former instead of an iodised one; and many admirable and suggestive articles have been contributed by him to our literature which have an important bearing on this subject.

It was in 1862 that Major Russell began to direct his attention to the abbreviation of the exposure in the camera by the adoption of a modified form of developer. About this period Mr. Borda, of America, had observed certain phenomena in connection with the exposure of tannin plates to the vapour of ammonia. It was noticed that plates thus fumigated, whether before or after exposure, were rendered more sensitive, but owing to what cause or through what special action no one seemed to be then aware. From a result observed by Mr. Borda, Major Russell deduced a theory which, after a course of experiments, enabled him on November 15, 1862, to publish in THE BRITISH JOURNAL OF PHOTOGRAPHY (page 425) a matured and practical method of alkaline development.

But in conducting his method of developing bromised films by the mixture of ammonia with pyrogallic acid, Major Russell noticed a most curious peculiarity. Observing first of all that it was desirable, when preparing a sensitive bromised film, that every trace of nitrate

of silver should be eliminated, he gave his plates a very protracted washing. He then began to observe that in proportion to the duration of the washing given to the plates, although the sensitiveness was increased, so was the liability to fog under the action of the alkaline developer. This set him athinking, and as the result of this reflection, combined with many more experiments, he eventually discovered the fact now known by every dry-plate worker, namely, that in alkaline development a soluble bromide is necessary as a restraining agent. We honour a man who could thus patiently "run to earth," with much pains and long-continued experiments, an irritating annoyance which seemed to bar further progress. Whatever Major Russell may yet be spared to achieve in the way of photographic discovery or invention, he has the proud consciousness of having, by his bromide films and his perfected system of alkaline development, already achieved a work that will ensure his name being perpetuated in the historical records of photography.

In 1864 the Photographic Society of France commenced the presentation of four medals to the four persons whom they judged to have done most for the advancement of photography in each year. Three of the medals in the first year were awarded to Englishmen —the late Sir David Brewster, Dr. Warren De la Rue, and Major Russell. To Major Russell was also awarded a bronze medal at the Dublin Exhibition in 1865, for photographs of groups of cattle and moving vessels taken on dry bromide plates.

It would prove a work of supererogation to dwell upon the numerous valuable contributions made by Major Russell to the literature of our science; we need only refer the reader to the volumes of The British Journal of Photography and other serials of a former period. We shall briefly summarise, in a few sentences, some of his labours in past years.

We have already alluded to the important improvement effected by Major Russell in the collodio-albumen process, which he practised soon after its publication by Dr. Taupenôt. Among other applications of gallic acid, he, in conjunction with Mr. Hardwich, worked with, and wrote on, the gum and gallic acid method, although he gave it up on account of the blistering property of the gum. It was from the good effect of substituting tannin for gallic acid with gum that he was led to try and recommend the use of tannin alone as a preservative for collodion. He then discovered and published the great sensitiveness of bromide of silver freed from nitrate of silver on dry plates. The sensitiveness of this salt had previously been discovered and utilised by Dr. Hill Norris, but the facts had not been published by him. Next followed the discovery of alkaline development, to which reference has been already made.

To Mr. Marlow, of Birmingham, is due the credit of discovering and publishing the fact of halation or blurring being caused by the reflection of light which has passed through film and glass, and that the evil could be prevented by absorbing such light. That important discovery, communicated to the London Photographic Society, owing to the treatment it received at the hands of that Society, lay dormant for several years, when Major Russell energetically took up the subject, and, in spite of the dominant party in the Photographic Society, succeeded in forcing the matter upon public attention, and with so much effect as to lead to the introduction of, first, the now well-known method of backing plates to prevent halation, and, second, to the subjecting of himself to a series of petty annoyances at the meetings and in the journal of that astute body. It would be little to the credit of the above Society were we here to recount the steps which led to Major Russell's withdrawing himself from its ranks; but we abstain from doing so, as the London Photographic Society has since those days, by a successful effort, got rid of the disturbing elements in its management.

Two questions of great public importance were investigated by Major Russell, and the results published, namely, the cause of dipper-marks on the collodionised surface, and the nature and conditions of the formation of the double salts which cause pinholes in films. In addition to communications on these subjects, he wrote with much vigour and clearness on numerous topics of current interest, as will be seen on reference to previous volumes of our own and contemporary journals. We regret to be compelled to speak of these contributions in the *past* tense; for he felt so keenly the uncourteous treatment received from the then dominant "clique" of the London Photographic Society, that from that time his papers appeared with diminished frequency, until at length they ceased altogether. Should Major Russell once more give to the public some of his well-matured experience, especially in connection with the comparative sensitiveness of bromide and iodide of silver in a dry state, and other topics of a similar character now engaging the attention of experimentalists, we can ensure him respectful and serious attention. And this leads us here to remark that in the course of a private letter we recently received from Major Russell when referring to the very topic just named, he expressed his conviction, founded upon former but well-remembered experiments, that while iodide of silver would be found to be *less* sensitive than bromide, it might at first sight appear as if it were really more so, owing to the greater rapidity with which the developer acts upon the iodide. Quoting from memory, as we do at present, we prefer not to trust ourselves to give the data on which the conclusion was arrived at, but, to say the least, it seems extremely plausible.

We here give a *résumé* of the last dry-plate process published by Major Russell, and by means of which it is well known that dry plates may be prepared possessing a degree of sensitiveness equal to that of wet plates:—Let the collodion be salted with eight or nine grains of bromide of cadmium to the ounce, and the plate coated with this preparation excited in an eighty-grain silver bath. It is of importance that it be allowed to remain in the bath a long time —not less than a quarter of an hour, for instance. It is now subjected to a thorough washing, after which a solution of tannin is applied to the surface, followed by a final rinse with water. The exposure, after the plate is dried, is about the same as that required for a wet collodion plate, and the image is developed by the now well-known alkaline method.

We conclude by recapitulating with more detail the way by which Major Russell discovered the value of bromide as a fog-restraining element in alkaline development. In order to secure the greatest amount of sensitiveness it was necessary not only to leave the plate for a considerable time in the exciting bath but also to subject it to a very complete washing. Observing that some negatives developed brighter and cleaner than others he was induced to investigate the circumstances attending the preparation of each, when he found that the cleanest negatives were those which had received rather less washing than the others. This led to the further discovery that a trace of soluble bromide was conducive to cleanness; and, after numerous experiments, he found that this cleanness could be secured by the mere addition of bromide to the alkaline developer. We need scarcely observe that no one now thinks of developing without this addition.

To enter at length into all the excellent ideas and suggestions which we owe to Major Russell would be to prolong this *memoir* unreasonably. The labours of many men are appreciated only after death; those of Major Russell, we are happy to say, are thoroughly recognised while he is still in the full enjoyment of health and strength, and we trust he may long be spared to devote his energies to the science for which he has already done so much and for which he still retains an ardent attachment.

Our portrait of Major Russell is from a negative by the late Mr. O. G. Rejlander.

## Our Editorial Table.

The Chemistry of Light and Photography in its Application to Art, Science, and Industry. By Dr. Hermann Vogel.

London: Henry S. King & Co.

Any volume bearing on the title-page, as its author, the name of Dr. Vogel—a well-known contributor to photographic literature and the President of the Berlin Photographic Society—demands minute examination. The volume before us forms one of a most interesting and excellent series, entitled the *International Scientific Series*, now in course of publication by Messrs. Henry S. King and Co. The interesting nature of the series we deduce from the subjects of the volumes already published and those yet to be published; their excellence, at least in individual instances, we infer from seeing among the contributors such names as those of Huxley, Tyndall, Spencer, Draper, and others. In this, the fifteenth volume of a series which bids fair to be a numerically large one, Dr. Vogel certainly finds himself, as an author, in good company.

At starting we are somewhat puzzled in what category to place the book; for while it is too deficient in the technics of our art-science to render it of use to the photographer, it contains that element in too great a degree to make it valuable as a mere popular work—such a work, we mean, that, if utilised as a lecture at a mechanics' institution, would satisfy the requirements of the public. As its author has evidently not had the most remote intention of its being used as a work of reference with regard to historical facts, we experience, in consequence, the difficulty of classification at which we have hinted.

For a book intended for English readers, and on a subject so intimately associated in its rise and progress with England, it seems

singular that the publishers should have selected a foreign author. This gives rise, almost necessarily, to some curious historical admixtures. For example: in Chapter III., which opens with a reference to the labours of Daguerre and Sir John Herschel, the author goes on to speak of the introduction, by Mr. Fox Talbot, of the sensitive paper process with which his name is so well associated, adroitly merging into the fact, several times repeated, that the various papers, chemicals, printing-frames, dishes, &c., are to be obtained from Mr. Talbot—quite another Mr. Talbot—who is a dealer in apparatus in Berlin, at an address fully given. This jumbling together of different things which are brought in this manner to a focus on a business establishment in Karlstasse, Berlin, may probably not have been done with any business intentions at all; but this method of blending the historical and commercial is not usually practised by authors of works intended for English readers. Moreover, if it really were found necessary to state the fact that a certain Berlin tradesman manufactured and sold sensitive permanent printing paper, would it not at least have been honest to couple the announcement with the further fact that in the country in which the book is intended to be circulated such paper has been for several years a recognised article of manufacture.

There are certain obscure passages in the volume of which we fail to grasp the meaning; such as—"Even chemical photographers prepare photographs in the form of *cartes de visite*" (page 53). But this will probably be owing to some inability of the translator to grasp Dr. Vogel's ideas; and here we cannot help commiserating with the author and publishers upon the rendering into English of the original text. It is not in accordance with the importance of the subject that English readers are treated to such terms as "white-of-egg process" for *albumen;* to "the little flat box called the cassette" for the *camera dark slide;* to "green vitriol" for *protosulphate of iron;* to "lighting gas" for *carbonated hydrogen;* to "cannel coal" for *carbon* for a battery; to "quicksilver" for *mercury;* to "cheesy" (curdy) precipitates; to "salts of iodide." Much of the value of the book is lost through its translation not having been entrusted to some person even moderately acquainted with photography, and through the final editing not having been done by some English expert. Although this might have led to a few pages being eliminated, and a few chapters re-written, the work would have been much improved. We throw out the hint in case a second edition is called for.

We observe that, in referring to the production of enlarged photographs of microscopic subjects, Dr. Vogel gives a drawing of a cheap French upright microscope—one of the description sold in this country as toy microscopes, and gives hints how to photograph by the means of "such a microscope." He mentions the names of three continental photographers and one in America who have "achieved excellent results" in microphotography. Has the author no friend to inform him that it is a matter of world-wide notoriety that the *most* "excellent results" in this direction have been obtained by photographers and microscopists in a country in connection with which he appears to be putting himself into the position of a preceptor giving much-needed information, whereas he is actually, to use a homely expression, merely "carrying coals to Newcastle."

We should have liked very much to have been able to speak of this pretentious book in other terms; but the more we peruse it the more we find matter for dissatisfaction. The leading idea under which the work is issued is most excellent. A good "international scientific series" would prove a boon if well carried out; and that the publishers desire to do their duty to the full is evident by the excellent style in which the volume has been produced. To render the work more worthy of the place they doubtless wish it to occupy it is only necessary that the editor should take a wider view of what has been done, and what is at present being done, in other quarters of the world than those to which he has confined his observations, and then secure the services of a translator not only equally well acquainted with the subject, but also conversant with the technical idioms of the language in which the book is printed. Among the illustrations are two excellent pictures showing in juxtaposition prints from two negatives, one of which has been "retouched" and the other appears just as developed.

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Photographic Views of the English Lakes.

By Payne Jennings.

London: W. A. Mansell & Co.

It is needless for us here to say anything with regard to the great artistic skill and photographic ability displayed by Mr. Payne Jennings; *that* we have already done, and have nothing now to add to, and certainly nothing to subtract from, those commendatory remarks. In the present series Mr. Jennings has worked to excellent purpose a rich and ample field—the lake districts of England—and we have now before us selected examples of his work.

In subjects of this kind it is not very easy to single out any for special commendation, their uniformity of excellence being remarkable; but we may mention a few of the pictures possessing exceptional merit.

No. 1,074 (we quote from a comprehensive catalogue issued by Messrs. Mansell and Co.), *Rydal Water*, is a work in which an angry sky only serves to render more attractive the charming scenery of which the terrestrial portion of the picture is composed. No. 1,178, *High Crag, Buttermere*, is a scene of a different kind, being of a more imposing and gloomy character; the deep shadows of the mountains which forms the background are reflected in the lake up to the edge of the foreground. This view was taken early in the morning. Of still another type is 1,153, which, as well as 1,156, are exquisite views of Derwentwater, the former representing an evening scene. A boat in the foreground imparts life and animation to the picture.

*Grasmere* is ably represented by 1,107—a view taken from Old Pack Horse Road—having a foreground richly decorated with ferns, together with an old roughly-built stone wall effectively introduced; while *Ullswater* is equally well represented by 1,192—a view taken near Stybarrow Crag—in which we find a boat partly drawn up on the beach and overshadowed by the branches of two large trees, the point of view being so selected as to give prominence to these fine trees, making the lake itself a kind of accessory.

The famous *Falls of Lodore*, concerning which Southey so rhythmically wrote, are in this series depicted, as they always are, dashing furiously over the rocks, leading the spectator insensibly to imagine that he is listening to the roar of the waters. But there are also other falls—such as the *Barrow Falls, near Keswick, Ara Force,* and others—all possessing equal excellence. The pictures are well printed and of a good tone.

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# Meetings of Societies.

## EDINBURGH PHOTOGRAPHIC SOCIETY.

The annual holiday and excursion, under the auspices of this Society, came off on Thursday, the 8th inst. For some days previously the public were made aware, by newspaper advertisements, of the intention of photographers generally to close on that day; and so popular has the institution become that, with perhaps only a single exception, every establishment of importance was shut.

The excursion was arranged to be by canal barge to Almond Dell—a trip which, judging from the fact that the photographers had already gone there several seasons in succession, seems to be a very popular one. The hour fixed for starting was nine o'clock, but half-an-hour before that time the indefatigable Secretary, Mr. Yerbury, was on the ground, and together with several members of the committee was busy superintending the decorating of the barge.

By and by cabs and traps of various kinds were seen to issue from the several streets by which access to the canal is obtained, and by 9.30 nearly the whole party, numbering over seventy, had assembled. It is something of a psychological curiosity that on such occasions there must always be some one too late, and this was no exception to the rule, as on calling the roll it was found that there were three absentees. As, however, they had all to travel a distance of many miles, and one of them had to cross an arm of the sea before reaching Edinburgh, there was some excuse to be made for them, and, therefore, ten minutes' grace was allowed, after which, leaving instructions to send them to Ratho by rail, the order to "let go" was given, and the gaily-decorated barge, accompanied by the cheers of the bystanders, floated gently along the stream.

Immediately on getting under way the President addressed the company, intimating that programmes of the games and of the order of proceedings for the day were now in the hands of the committee, the members of which had been by the Secretary decorated with a blue and gold order of —— well, he would not say merit, until the close of the day had shown how they discharged their duties, but would designate it the "order of service," and had no doubt that the word "merit" would be fairly earned. He further intimated that the various departments of the proceedings had been entrusted to one or more of the stewards, to whom, and to whom alone, all applications for information, &c., ought to be made. As the programme of the games, which had been written by Mr. Dobie in beautiful fancy letters, on a large card, was somewhat unique, we give our readers the benefit of it:—

"*Edinburgh Photographic Society, 8th July*, 1875.

1. Foot Race, 100 yds., gents....A Gold-plated Claret Jug.
2. Do. 50 yds., ladies....A Gold-plated Opera Glass.
3. Do. 50 yds., one leg only, gents.............. Caso Ornato di Cigari.

4. Foot Race, 75 yds., ladies ....Una Album Fotografico.
5. Walking Match, ½ mile, gents..Cronometro ë Ornamenti di Eleganti.
6. The lady who keeps longest up the Skipping Rope ...... } Una Forsa di Monata.
7. Putting the Stone, gents......Una Lanterna Magica.
8. Running Hop, Step, and Jump, gents ............ } Una Opera di Arte.
9. Foot Race, 30 yds. Running Backwards, gents........ } Instrumento Musicale.
10. Foot Race, 20 yds. Blindfold, gents .................. } Una Mostra di Scaltura di Legno."

Of course this caused considerable excitement, especially as to the source from whence the prizes had come; but Mr. Dobie kept his counsel so well that no information could be obtained till the time, on the return journey, which had been set apart for their distribution.

Immediately on the close of the President's address the music, which was furnished by a piano and a string band, was called into requisition, and Mr. Kyles, of Portobello, who had been appointed master of the ceremonies, started the dancing, the first quadrille being led off by the President; and it may be said once for all that it was kept up with the usual *verve* until "Within a mile o' Edinburgh Toun," on the return home. Luncheon was served at eleven o'clock. The dancing was varied by music and singing, of which the Misses Murray, Docherty, and Paul, and Messrs. Fairbairn, Yerbury, Muir, &c., contributed a large share. The time seemed really all too short when the barge was moored at its destination at 1.30 p.m.

On landing the party broke up into sections and amused themselves—some on the banks of the Almond, some in romping about the dell, and some in visiting the old miller and his older mill, where they got initiated into the mystery of the preparation of oatmeal, and were permitted to taste that article of national consumption as prepared for the Glasgow and Edinburgh markets respectively; for, although these cities are separated by only a ride of an hour and a-quarter, the proclivities of the respective cities as to the mode of preparing their oatmeal are very different.

By 2.30 p.m. all had again assembled on the barge—which during the interval had been converted into a comfortable dining-hall—and did full justice to the good things prepared for them by the purveyor, Mr. Lawson, of Queen-street.

Dinner over, washed down by a liberal allowance of champagne, &c., generously contributed by a few friends of the Society, the games were at once proceeded with. These were apparently very much enjoyed by the younger members of the party, while a number of those less fond of rather violent exercise strolled through the glen in twos and threes, enjoying themselves to the utmost.

Shortly before starting on the return "voyage," the weather being then somewhat overcast, the whole party were assembled on a bank for the purpose of being photographed. Under the direction of Mr. Ross, the President took up a position to the left of the group, and posed as if in the act of addressing the audience, so that a really excellent picture as well as a good photograph ought to have been secured. It would not do, however; the suddenly-assumed gravity seemed to strike the minds of some of the party as something so ludicrous that they burst into a laugh, which instantly became contagious, and the lens had to be capped before half the necessary exposure was given. The result, of course, is just sufficient to show that a fair picture has been missed, and to convey the lesson that such operations should always be made before dinner.

At six o'clock the barge again got under way, and the homeward journey was certainly quite as enjoyable as the outgoing one. Immediately after starting tea was served out, and the music and dancing were resumed with quite as much energy as in the morning.

When about half the homeward journey had been accomplished Mr. Dobie placed a large trunk in the centre of the barge, and, assisted by the Secretary, proceeded to call out the names of the successful competitors for the various prizes, the presentation of which was really the feature of the evening, so far as the fun was concerned. This will be evident from the mere mention of the nature of one or two of the prizes as they were unfolded from the somewhat large quantity of paper in which most of them were enveloped. The "cronometre ë ornamenti di eleganti," for example, turned out to be a penny watch, while the "instrumento musicale" was a toy trumpet of like value; and "una mostra di scaltura di legno" proved to be one of the ever-popular jumping-jacks that impart so much pleasure to the rising generation.

Shortly after the distribution of the prizes the President requested the party to form a circle in the centre of the barge, and intimated that it had been the custom on previous occasions to propose a few toasts. He thought the custom should not be departed from, and promised that the business would occupy only a few minutes. The first toast was, of course, "The Queen," and he knew it was only necessary to mention it in order to secure a hearty reception. The toast was responded to with acclamation. After the national anthem had been sung the President proposed the toast of the day, "The Edinburgh Photographic Society," which was also, of course, duly honoured.

Mr. W. H. Davies then said he had been asked to propose the health of the donors. That he had really much pleasure in doing. Mr. Muir, their excellent ex-President, he said, wished his name to be coupled with the toast, and although he well deserved the very great honour, yet from motives of policy he must decline to do so. The fact was Mr. Muir, as they all knew, was given to make such long speeches that if he were to begin and continue till they got home where would the dancing be? Mr. John Macnair, Mr. Stoddart, Mr. Robert Hay, either or all, would have done admirably but for the little fact that they were not present, and as neither the ex-Secretary nor present Secretary were available, he had most reluctantly to fall back on Mr. Dobie. Mr. Dobie, however, had given his word that he would not speak more than an hour, and as he, by his genius, wit, and humour, combined with his eleven other good qualities, had, in keeping up the fun and frolic, cast into the shade all the rest of the party together, he fairly deserved the honour of having his name coupled with the grand array of donors, and he hoped that they might grow in numbers and in liberality every year.

Dr. Nicol said he had been asked to propose the health of their excellent purveyor, Mr. Lawson, who had, he was certain, discharged his rather difficult duties to the entire satisfaction of all concerned; and, as so much depended on a good dinner, he was quite sure that in that way he had contributed much to the success of the excursion.

The only other toasts were "The President," "The Ladies," and "The Committee," all of which were heartily responded to, and then the dancing was resumed.

In this way the journey and the evening passed very pleasantly, until shortly after ten o'clock, when, amid the ever-welcome yet, as a parting song, somewhat saddening strains of "Auld Lang Syne," the barge arrived at home once more, and amidst much hand-shaking and many resolutions "to meet again some other day," each looked for the nearest road to his or her habitation, all being delighted with the day's proceedings.

## WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.

On Wednesday, the 26th May, the above Society held its first* outdoor excursion, at which there was a numerous gathering. The place selected was Bolton Abbey, near Ilkley. The party left Bradford by rail at 1.30 p.m. for Ilkley, arriving there at 2.30, where a number of vehicles were in waiting to convey them to the Abbey. Several gentlemen, including Messrs. Tench and Hawkins, of London, joined the members at the station.

The weather was most propitious, and the drive along the narrow lanes, blue with forget-me-nots and wild hyacinths, was something to be remembered, and was thoroughly enjoyed by all present.

On reaching the Abbey some of the party left the conveyances, and very soon several cameras were pointed at the fine old ruins and surrounding scenery. The remainder drove forward to the Strid—a romantic spot, where the river passes through a rocky bed, narrowed in some places to a width of about three feet, through which the water rushes and roars, throwing up clouds of spray as it dashes against the rocks, which are worn into an endless variety of fantastic forms by the continued action of the boiling, foaming current. Here those present were grouped and photographed by Mr. Holgate, and then divided into various small companies in search of the picturesque views with which the place abounds. Some crossed the river by leaping the Strid, and visited the waterfall in the Valley of Desolation; others wandered along the woody paths, reminding one of Nicoll's lines:—

"Most beautiful—most passing sweet
It is to wander in an hour like this—
Where twisted branches overhead do meet,
And gentle airs the bursting buds do kiss;
Where forest-paths, and glades, and thickets green,
Make up of flowers and leaves a world serene."

The party met again at 6.30, in time to drive back to Ilkley, where a substantial knife-and-fork tea was awaiting them at the Rose and Crown Hotel, to which ample justice was done; after which they left for Bradford, where they arrived about 9.30 p.m., having had a most enjoyable day amongst some of the finest scenery the West Riding of Yorkshire possesses.

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An ordinary monthly meeting of the above Society was held on Monday, June 7, at the Victoria Hotel, Bradford,—Mr. J. W. Gough, President, occupying the chair.

The minutes of the previous meeting having been read and confirmed, Dr. Wallace, of Halifax, was elected a member.

The President proposed a vote of thanks to the Secretaries for the satisfactory arrangements of the excursion to Bolton Abbey on the 26th May.

Mr. Greaves suggested the advisability of holding the ordinary monthly meetings out of doors, thus combining an excursion with a business meeting.

It was, however, considered by a majority of the members present that it was preferable to continue the ordinary meetings at the Victoria Hotel, and have the excursions as special meetings.

* Through an oversight on the part of the Secretary, this report has been held back a considerable time—the report of the *second* outdoor meeting having appeared in our columns on the 2nd instant.

It was further resolved, on the motion of Mr. Burrow, that the next excursion should be to Hebden Bridge on Wednesday, the 23rd ult.

The rest of the proceedings were of a purely conversational character, after which the meeting was adjourned.

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Another ordinary monthly meeting of the same Society was held on Monday evening, the 5th inst., at the Victoria Hotel, Bradford, when there was a numerous attendance,—Mr. J. W. Gough, President, in the chair.

After the confirmation of the minutes of the previous meeting, a somewhat lengthy discussion on the relative merits of wet and dry-plate photography took place. One of Mr. George Hare's automatic changing-boxes was inspected by the members, and greatly admired for its simplicity and working capabilities and its fine, easy, and ingenious movements.

After numerous expressions of admiration from Messrs. Wormald, Burrow, and others,

Mr. A. Sachs proposed a hearty vote of thanks to Mr. Hare, which was seconded by Mr. Whitley, and was cheerfully responded to by the members.

A conversation then ensued respecting the weekly half-holiday which has or is likely to become universally adopted in the Bradford, Halifax, and Leeds districts.

Mr. Smith, of Halifax (in reply to Mr. Sachs), said they ought to make some sacrifice and try for a whole day, so that members wishing to take any pictures at a distance would be able to do so, as they could not go far from home during half-a-day, more especially if they had to give three-quarters of an hour's exposure.

Mr. Harper, of Leeds, thought it was very nice to be able to go for a whole day, but concurred with Mr. Sachs that it would in all probability be very inconvenient to close their places of business for so long a time, especially where a considerable number of hands were employed, as it would necessarily involve a consideration of pounds, shillings, and pence.

Mr. Sachs said it could not reasonably be expected of them to close for more than half-a-day; it would not be businesslike to do so, as persons might come from a long distance earlier so as to sit before closing time, and if the holiday were made into a whole day the result would, doubtless, be a serious loss of business.

Mr. W. E. Batho was of opinion that to try for a whole day would probably result in the loss of the boon they already possessed.

After several expressions of opinions, *pro* and *con*, by Messrs. Holgate, Gough, Rushforth, Wormald, Jenkins, &c.,

The Secretary announced a question from the box, viz., "What effect will albumenised plates have on the negative bath, and will they cause fog?

Mr. Sachs had used it for a number of years and had never found any disadvantage.

Mr. Illingworth informed the members that he had used it for more than two years, and was highly pleased with the results; but if any albumen got on the edge or back of the plate he had no doubt it would cause fog.

Mr. Wormald informed the members that he had successfully used as a substratum a solution of thirty grains of gelatine to a quart of water, using it over and over again until about one hundred 12 × 10 plates had been coated.

The Chairman and several gentlemen having spoken on this subject,

Mr. Batho then read a paper on

### The Lambertype.

I believe it to be a part of our nature to rebel against a threat. Somehow it invites opposition. A request coupled with a threat invariably ensures unwilling compliance, and a search of these is force enough to carry out the penalty.

While not laying any claim to infallibility, I propose to examine the value of the letters patent granted to Alexander Melville Clark, being a communication from abroad by Claude Leon Lambert. First, I will point out a few things that on some future occasion I may have to refer to that will invalidate a patent. If a patent be taken out in the joint names of two or more persons, and it be discovered that one or more of such persons had no part in the invention, the patent is void. The invention must be new—not used before in a business sense even by the inventor. Again: if a specification claim as part of the invention something not new along with something new it will invalidate the patentee's claim to that which was his own discovery, &c.

I will now proceed to deal with the "Invention for an Improved Method of Retouching Photographic Negatives and Positives," for which letters patent were granted, dating from the *eighth day of May*, 1874, and leave the one under date of October 21, 1874, termed "Improvements in Producing Carbon Photographs," on the principle of its being bad generalship to attack two armies at once. I will now proceed to read the specification No. 1634, year 1874.

The concluding portion I will re-read:—"Having described the nature of the invention and the manner of performing the same, I declare that what I claim as the invention, to be protected by the hereinbefore in part recited letters patent, is the method of applying a semi-translucid sheet on each side of a negative or positive, and of quickly and readily retouching by operating on these surfaces as herein specified."

Here is another extract from a paper read by Mr. G. Croughton, and published in The British Journal of Photography, December 19, 1873, and in the *Photographic News*, December 24 (should be 26), 1873:—"In elderly people the lines and texture of the face is far too marked in the enlarged negative. This can be much softened and reduced by printing through tracing-paper. Strain over the face of the negative so interposing a thickness of tracing-paper between the sensitised paper and the negative. I always strain tracing-paper on the reverse side of the negative, as it serves to soften the printing and is a capital medium for working upon."

Evidently, as Mr. Croughton occasionally used paper on the front of his negatives and always on the back, and published it in December, 1873, it is clear he published a method in the latter part of 1873 whereby he occasionally used a *semi-translucid sheet on each side of his negative.*

You have now the material to enable you to judge as to the validity of the said patent. There is something noble about the man who takes out a patent and has the courage to drop it when he finds he has been forestalled; but they who, under the most clear evidence, take a contrary course—why one lacks expression for them sufficiently severe.

W. E. Batho.

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The Chairman said (alluding to the remarks of several members) that if a person was not in a position to oppose a patent, and had used the same process before the patent was granted, it was the duty of the other members of the profession to assist him should he have cause to test its validity in a court of law.

Mr. Batho remarked that unless photographers in this country took a stand unitedly they would not be able to resist these things, and must consequently submit.

On the motion of Mr. Burrow, seconded by Mr. Sachs, a very cordial vote of thanks was tendered to Mr. Batho for his practical paper.

A conversation then ensued respecting the more frequent reading of papers at the Society's meetings. It was considered a somewhat difficult matter to get papers on scientific subjects at this time of the year, as photographers were too busy to have the necessary time for making experiments.

It was then resolved that the next excursion should be to Kirkstall Abbey, near Leeds, on the 21st instant, and the meeting was then adjourned.

## LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

A special meeting of this Association was held on Tuesday evening, the 13th instant, at the Free Library,—the President, the Rev. J. D. Riley, in the chair.

The President said that the special meeting had been called to give the members an opportunity of witnessing a demonstration of the autotype process. He (the President) then introduced to the members Mr. H. Taylor, the representative of Messrs. Spencer, Sawyer, Bird and Co.

Mr. Taylor, after a few remarks explaining the manner of preparing the different papers, &c., used in connection with the process, then proceeded to give a number of practical illustrations of its working.

Several pictures were developed on the new flexible support and also on opal glass, and though Mr. Taylor had not had the opportunity of previously printing from the negatives to ascertain the number of tints required the pictures were perfectly printed, showing that the supposed difficulty of exact exposure was easily overcome after a little practice in judging of the density of negatives.

Some prints were afterwards transferred to the double transfer paper, and others so transferred that on being finished the prints had a beautiful enamelled surface. Other illustrations were given of the double and single transfer processes, all of which were watched with the greatest interest by the members, Mr. Taylor answering meanwhile numerous questions, he being evidently anxious that all possible information should be given.

The President, at the conclusion, said that he and, he was sure, the members also had been exceedingly delighted and interested by the practical illustrations of the working of the autotype carbon printing which they had just seen. He had, therefore, to express the thanks of the Association to Mr. Taylor for the able manner in which he had given the demonstration that evening. The process was so simple and easy that no one who desired to have permanent photographs would hesitate to adopt it.

Mr. Taylor, in reply, said he would only be too glad to give any explanation if necessary, and concluded by handing round a number of specimens of what the process was capable of producing.

The meeting was shortly afterwards adjourned.

# Correspondence.

## THE LAMBERTYPE PROCESS.

*To the* Editors.

Gentlemen,—If it will be any consolation to the Bradford correspondent, to whom you recently replied in your "Answers to Correspondents," to know that I have used, and exhibited the use of, paper

backings to negatives for years past, as well as the use of paper on the front, as referred to by your correspondent, it will afford me much pleasure.

Though I have used paper at the *back* of negatives for *stamping in effects*, and on the *front* for *softening* and *retouching*, separately, it never occurred to me to use paper on both sides at one and the same time, and if it had I should not have thought the idea worthy of a patent.

For a long time past I have made another use of paper at the back of negatives, and I shall now put the fact on record lest some other ingenious individual should also conceive the idea and hustle it into the Patent Office. It is this:—Damp a piece of thin writing-paper, run a gum brush round the edges of the *back* of a negative, and lay the damp paper down. When the paper is dry it will be as "tight as a drum-head." Then with a brushful of wet rouge draw the size and shape of the intended vignette. When that is dry soften the inner edge with a stump and put a rough, yellow paper mask outside. By this means a vignetting paper permanently attached to the negative is quickly obtained, and any size, shape, or degree of softness can as easily be produced. I have abandoned all other modes of vignetting for this.

When the negatives are treated in this manner printing in sunshine can be practised, and yet the vignettes will be all the same.—I am, yours, &c.,
11*a*, *Berners-street, W.*, *July* 8, 1875. J. WERGE.

## THE LATE GOVERNMENT ECLIPSE EXPEDITION.

*To the* EDITORS.

GENTLEMEN,—I cannot pretend to represent the eclipse committee of the Royal Society, but certain statements contained in Dr. Vogel's communication to the Berlin Photographic Society and reprinted in your issue of July 2nd, are highly calculated to mislead your readers and as such must not be allowed to pass without notice.

Passing over the minor grievances of "prickly heat" and the profusion of ladies on board the P. & O. Co's steamer "Baroda," Dr. Vogel's chief cause of complaint appears to be the instruments provided for his use. He states:—"I have *no telescope but a common six-inch lens—one with immense diffusion of focus—and no camera.*" The lens referred to was an excellent lens by Dallmeyer, of three-inch aperture and twenty-three-inch focal length, lent to Mr. Norman Lockyer by Lord Lindsay. Far from having "immense diffusion of focus" I have with the same lens frequently obtained photographs of the solar spectrum in good focus from beyond H to nearly as far as F.

The "machinery" of which the absence is so much bewailed I take to be a driving-clock. The mirror intended for use with the lens above referred to was mounted on an equatorial stand workable by hand (lent by the Indian party), and thus one movement only was necessary to keep the sun's image fixed on the slit plate of the spectroscope. Any-one acquainted with the principle of the heliostat will at once perceive that no difficulty would be experienced in following the sun's motion during the four minutes of totality. In fact, one of the instruments supplied to our party—the polariscopic camera, lent by Mr. W. Spottiswoode, Treasurer R. S.—was mounted for alt-azimuthal motions, and although requiring two movements and manipulated by a volunteer observer, comparatively inexperienced in the use of such instruments, no difficulty was experienced in keeping the sun's image absolutely fixed during the required time.

I am quite at a loss to know why Dr. Vogel complains of not having been provided with a telescope. As soon as his instrument was unpacked I at once perceived that it was *totally unfitted for use with a telescope.* The justness of this remark will be seen when I state that the instrument in question was a two-prism spectroscope mounted on a heavy metal stand, and capable of movements in altitude and azimuth, by means of hand-worked tangent screws. The observing telescope of this spectroscope was replaced by a camera in the usual manner. Surely Dr. Vogel must have forgotten his own instrumental resources when he raises the plaintive cry of "no camera." Nothing under Mr. Newall's great equatorial would have carried the weight of Dr. Vogel's "spectrograph;" and supposing that instrument could have been transported to the Nicobar Islands we should not have been one whit better off, for the said "spectrograph" was unprovided with any means of mounting it on to an equatorial.

As one of the Englishmen charged by Dr. Vogel with having learnt how to photograph a spectrum from his writings, I cannot but express my amazement at such a statement. The history of spectrum photography from the time of Becquerel and the Drapers down to the more recent productions of Rutherfurd and Lockyer—photographs which Dr. Vogel has not even approached for detail—must be familiar to most readers of this Journal.—I am, yours, &c., R. MELDOLA, F.C.S.,
*In charge of the English Branch of the Royal Society's late Eclipse Expedition to the Nicobar Islands.*
*London, July* 12, 1875.

NEGATIVE RETOUCHING.—Messrs. Morgan and Co., of Willesden, have submitted to us for examination several prints from negatives retouched by them. The retouching is skilfully effected, and appears to be kept within proper limits. In many instances retouching is not only excusable but commendable, and this remark applies appropriately to Messrs. Morgan and Co.'s specimens.

## ANSWERS TO CORRESPONDENTS.

PHOTOGRAPHS REGISTERED.—
A. M'William, Garliestown, Wigtonshire.—*Portrait of Countess of Galloway.*
R. Ward and Co., Cork.—*Two Photographs of a Mermaid.*

☞ *Correspondents should never write on both sides of the paper.*

M. LIEBERT.—Received. Thanks.

R. HOLGATE.—No address furnished.

VERNON HEATH.—We shall communicate with you.

THE ENTREKIN OSCILLATING ENAMELLER.—Notice in our next number.

REJLANDER FUND.—Received from Major Russell, £1. From Captain Fox (Lutterworth) £1 1s.

CAPTAIN FOX.—We have received the sample of your oleo-bromide pellicle emulsion, which will be tried and reported upon.

W. H. H.—Gelatine gives a precipitate with alcohol, also with chlorine. It does not give any with gallic acid, but does with tannin.

J. BROWN.—Place the diaphragm about a quarter of an inch nearer to the front lens, and the evil of which you complain will be remedied.

E. B. L.—Our "candid opinion" is that the process is a good one; we have seen it worked. It requires, however, artistic skill to succeed with it; but *that*, we doubt not, you possess to the requisite extent.

REV. A. F.—The bath contains too little acid. It will require the addition of about twelve drachms of glacial acetic acid. For the waxed-paper process, equally as for the negative albumen process, the exciting bath must be very acid.

AN ASSISTANT.—To prevent the legs of a camera tripod-stand from slipping on a smooth stone pavement, let a small piece of string be so fastened as to connect them altogether. This will prevent the legs from opening, and consequently from slipping.

X. Y. Z.—We cannot in this page enter into the dispute between you and the friends of the sitter; but we are sufficiently conversant with the law of copyright to know that you are legally in the wrong, and if you allow the case to go before a judge you will be mulcted in damages and expenses, and very properly so.

B. B.—Our correspondent has a portrait lens which does not work to focus, the error, of over-correction, being in the front lens. He asks—"In what way can this be remedied?" Let him re-grind the inner or contact surfaces of the flint and crown of which the front lens is composed, employing curves of larger radius.

IGNORAMUS.—1. Mr. Thomas Davidson was at one time an optician in Edinburgh; he subsequently removed to Newcastle-on-Tyne, where, if still alive, we presume he is at present.—2. A single lens made of pale blue glass will doubtless be superior to one of plain colourless crown glass; but neither of them will equal one that has been achromatised.

J. W. LEIGH.—We remember conversing with the late Mr. Petschler concerning the best method of intensifying negatives prepared according to his formula, and he then gave it as his opinion that nothing was more manageable or produced a better result than the old method of applying a solution of pyrogallic acid, *plus* nitrate of silver and citric acid. This is also the opinion of several of our best collodio-albumen practitioners.

J. H.—On examining your negatives we find them somewhat over-exposed. The one of the young lady would, however, print pretty well; but you must focus more sharply and obtain a head-rest to enable your sitters to keep their heads steady. The backgrounds are painfully sharp; the sitters are too much the reverse. Obtain also a better background; even an old blanket would be an improvement upon the present state of your art-adjuncts.

JAMES B.—1. While there is no doubt that a camera can be made on the pantascopic principle to include the whole circle, or 360°, in practice the angle of view included is limited to a third of that, or thereabouts. In our own camera the angle of view included is 120°, measured, of course, on the base line.—2. If the pantascopic camera be well made and its lens properly adjusted it will give negatives which will bear an enlargement of four diameters.

A SHEFFIELD SUBSCRIBER.—Without stating what we believe to be the "very best" method of preparing iodide of cadmium, we may inform you that the sample obtained from London was made by dissolving twenty-six parts of iodide of potassium and fifteen parts of sulphate of cadmium in water. The mass resulting after evaporation was heated with alcohol; and as the iodide of cadmium formed by double decomposition is soluble in alcohol, it is in this way separated from the sulphate of potash also formed.

S. P. Q. R.—1. It is difficult to answer your first query; in London the price of *cartes* range from 3s. 6d. per dozen to a guinea and a-half for half-a-dozen.—2. To render the cloth waterproof give it a coating of gelatine, and when dry brush it over with an infusion of nutgalls; or, apply a solution of soap in the first instance, followed by alum solution.—3. State what kind of developer you use, whether iron or pyrogallic acid, and whether acid or alkaline.—4. For taking negatives of clouds either a landscape lens or a portrait lens may be employed. The latter lens must be used with a small diaphragm.

*** We are compelled to leave over till next number several "Exchanges" and "Applications for New Patents."

CONTENTS.

THE BRITISH

# JOURNAL OF PHOTOGRAPHY.

No. 794. Vol. XXII.—JULY 23, 1875.

## THE NEW COLLOTYPIC PROCESS OF M. DESPAQUIS.

Those of our readers interested in mechanical printing cannot fail to have been for some time aware of the existence of a process of preparing printing surfaces by M. Despaquis, said to possess certain important advantages over pre-existing methods. Surmise has been busy with regard to the precise character of this process; but nothing in the nature of definite information has been accessible to the numerous persons who have recently been making inquiries respecting it beyond the rumour that, by its means, the value of mechanical printing by the *lichtdruck* or collotypic process is so much increased as to admit of thousands of prints being produced from a single printing surface, while at the same time the skilled hand-work of the painter has been superseded by the mechanical hands and arms of a machine. We are now in a position to give full and reliable details concerning M. Despaquis' process, being enabled to do so from a MS. now in our possession, for which we are indebted to Professor Stebbing, and also from the specification of the patent by which M. Despaquis has secured the process in this country.

At starting we confess to the extreme difficulty we have experienced in being able to eliminate, so to speak, the Despaquis process from the other processes of a somewhat similar description that have been already described in this Journal, and which are being practised throughout this and other countries.

So far as we can see, the leading idea in the mode of preparing the printing film seems to be the imparting to it of a hard, leathery consistency throughout its entire thickness. In order to convey this idea clearly we may divide the gelatine film into three imaginary parts or strata—that which is next the glass plate upon which it is spread; that which forms the upper stratum, and which acts as the printing surface; and, lastly, the portion situated between these two extremes. Now, when it is considered that by the hardening of a gelatine film it is rendered non-absorbent of water, the importance of having every portion of it thus hardened, with the exception of an exceedingly thin portion of the printing surface corresponding with the whites of the picture, will be apparent.

M. Despaquis is of opinion that this has not been effected in at least two processes which are named by him, namely, those of Albert and Edwards, which he says are carried out as follows, and we make use of M. Despaquis' own language:—

"The layer of albumen being placed on the glass is rendered partly insoluble either by the cooking or drying at a temperature of sixty to eighty degrees centigrade. It is then rendered totally insoluble and adherent to the glass by solarisation through the glass. This result arrived at the layer is then covered over with another layer of bichromated gelatine. This second layer being dried the glass plate thus prepared is placed in the pressure-frame under the negative to be printed, the gelatine side in contact with the negative and exposed to the light. After exposure the plate is immersed in cold water to free it from the bichromate not acted upon, or otherwise to fix it. In this manner two only of the three layers of the total have been rendered insoluble by the light—the one forming the support and adherent to the glass and insoluble beforehand; the other forming the exterior of the gelatine and solarised under the negative. But this solarisation under the negative of the exterior of the layer of gelatine has penetrated unequally according to the transparencies of the negative, and has not traversed entirely the intermediate thickness, which consequently remains hygrometric, and will absorb the water like the exterior parts of the layer which have been preserved from solarisation by the opacities of the negative, and should take the water which repels the fatty inks, so that, after a very limited number of proofs, the intermediate layer is found saturated with water, loses its adherence to the layer of albumen forming its support, and is dragged off by the inking-roller and the plate is destroyed."

As a result of the film being in this unsatisfactory condition it is averred that the printer, in order to avoid the rapid destruction of the plate, dares not sufficiently water it previous to passing the inking-roller over the plate; and in consequence of the ink, owing to this imperfect wetting, not being sufficiently repelled in the whites and half-tints, the proof loses its contrasts. Previous to making any observations on this we here give the method adopted by M. Despaquis for obviating the evil of which complaint has been made.

After the two exposures above named are made a third exposure must be made through the glass to let the light penetrate the film, and consequently render it insoluble and cause it to lose its hygrometric condition in its intermediate thickness, until it meets with the exposed part or half-tones, previously rendered hard by the exposure under the negative, the effect of this being the preventing of the water from passing between the blacks and half-tints. By this means the two exposures form the two links of a chain, and do not come away from the glass without great difficulty, permitting a greater number of proofs to be printed. This solidity of the layer allows the plate to be wetted much more, the proof does not lose its contrasts, and the whites remain pure. The application of this action, however, may be made in other ways:—

First: by suppressing the preliminary exposure of the layer of albumen, or, if necessary, suppressing it altogether and commencing to expose the surface under the negative, and then exposing the back of the glass to the light until this latter action meets the blacks and deep half-tints of the first exposure. It will be seen quite easily when the two exposures meet each other, and, consequently, the moment to stop the exposure to light when the proof commences to fade away and to become of one tint.

Secondly: after the layer of albumen has been first of all rendered insoluble, either by heat or exposure to light through the glass, a very thin coating of bichromated gelatine is applied to this first substratum, the thickness being such that the exposure through the negative allows the light to penetrate to render the blacks and the deep half-tints insoluble up to the substratum, so as to render them continuous. Instead of employing a sponge to effect the damping—a method which necessitates the use of a dry dabber to remove the excess of water and, above all, that left in the depressions forming the blacks of the image and which should take the ink—M. Despaquis employs a roller formed of porous stone, with the composition of which we are quite unacquainted. With this roller the damping is only effected in the reliefs of the plate; that is to say, in the parts not altered by exposure, and which ought to take the water and repel the fatty ink, consequently forming the lights of the picture. This renders the use of the dry dabber unnecessary.

From what has been said the reader will have a pretty clear idea of the nature of M. Despaquis' invention, on which we feel constrained to offer one remark. The description given of the processes, respectively, of Albert and Edwards are scarcely so complete as are warranted by the facts we long since published. These gentlemen not only recognised the existence of the evil so graphically described by M. Despaquis, but also took steps to obviate it—Albert exposing the back of the film to light in a manner not unlike that now patented by M. Despaquis, while Edwards effected the hardening of his film by mixing with it a solution of chrome alum.

## DESENSITISING *REDIVIVUS.*

It is somewhat curious that photography during the comparatively short period of its existence should have made, and continue to make, such rapid strides in its progressive march, when it is considered that photographers are, probably, of all men the most slow to learn even that which, in connection with their own profession, one would suppose they should be most anxious to know and eager to adopt; yet it is true that while they readily pay large sums for secret processes which may have been published years before, or for permission to work patents the principal features of which had been known long prior to the patent being thought of, they allow the record of some of the most valuable discoveries that have been made to pass away with little more than a glance, and only seem to recognise their value when, probably, in after years they are disinterred from the back volumes of the journals by some enthusiastic explorer of the memorials of the past, who accidentally alights upon and persistently forces them on their attention.

We have a good illustration of this state of inertia of the photographic mind in the question of the desensitising of the sensitive film, which has again cropped up in the *Photographisches Archiv*, and to which we called attention in our last number. So far back as 1865 it was conclusively shown by Poitevin, Vogel, Himes, Bow, and others that plates might be prepared in broad daylight, and after receiving a wash with a soluble bromide, iodide, or chloride, be stored away, and afterwards made ready for use by a simple immersion in a solution of almost any of the substances that can be used as a so-called "preserver" or "developer." We made a series of experiments at the time and published the results, and a considerable amount of correspondence followed the publication; but we fear that it led to little practical result, and doubt very much whether during the past eight years there has been a single photographer, either professional or amateur, who has taken advantage of the facts thus made known. This is all the more wonderful when we remember how great would be the convenience of such a method of working, and how much the freedom from errors of manipulation would be secured by the ability to prepare the plates in any part of the premises that might be most convenient, and with any quantity of light that might be desired. To the fortunate possessor of a well-appointed laboratory, with not only plenty of room at his disposal, but with also the command of a sufficient number of square feet of non-actinic glass to make his dark room almost as light as his library, this may not seem a matter of much consequence. To those, however—and they are by far the greater number—whose whole available light is admitted through several plies of yellow calico, or evolved from a yellow-paper-shaded candle, and whose workshop has to be extemporised in a bedroom or other domestic apartment every time a few plates are to be prepared, it must be a matter of the utmost importance, and one which not unfrequently decides the question whether the pursuit of photography is to be continued or given up altogether.

From previous observations our readers are aware that we believe the time must come when a washed emulsion will supersede all other preparations for landscape, and probably also for portrait, photography; but, as we have already said, such radical changes require a long period to elaspe before making a permanent impression on the popular mind or becoming anything like general in practice. Therefore, so long as the ordinary bromo-iodised collodion is sensitised in the nitrate bath we would strongly urge our readers to try the method of preparing the plates in open day and sensitising them by a simple wash or immersion in one or other of the many substances that have hitherto been used as preservatives.

With a view to bringing the matter once more under the notice of our readers we have during the last few days made a number of experiments, and are so thoroughly pleased with the results that we feel persuaded a fair trial is all that is required to convince even the most sceptical that the method is thoroughly practical, and the advantages of the process so self-evident that no words of ours are required in order to recommend it to the consideration of the readers of this Journal.

The collodion used contained six grains per ounce of a mixture of cadmium iodide and ammonium iodide and bromide in their equivalent proportions, and had been sensitised for about two months. The bath was of the strength of thirty-five grains, and contained in a glass vessel, which was removed from its wooden case that the light might be allowed to act on the film during the formation of the iodide and bromide of silver. On removal from the bath the plates were well washed in three or four changes of water, and then flooded with solutions of potassium iodide and bromide, ammonium iodide and chloride, and also sodium chloride. Some of them were dried in an ordinary drying-box at a temperature of 50° C., and the others in a rack in the brilliantly-lighted studio, with all the curtains removed, and were each exposed to the same light for two bright days. They were then removed to the laboratory, and under the light from orange glass flooded with tannin, beer and albumen, coffee, gum and gallic acid, and several other preservatives, and exposed—some of them while still wet and some after being dried—and good, clean negatives were obtained from every plate. The development was conducted in the ordinary way—some by acid, pyrogallic acid, and silver from the beginning, and on some the image was first brought out with alkaline pyrogallic acid, the latter requiring not more than a third of the exposure of plates developed in the former way. We need not enter into a minute detail of all the experiments made, but may sum the matter up by saying that we think the best *desensitiser* was found to consist of a solution of two grains each of potassium bromide and ammonium chloride; and that the best *sensitiser* was a solution of two grains each of gallic acid and gum arabic and ten grains of tannin. On plates thus prepared we had no difficulty in getting, in the studio, curtained down to only some forty feet of clear glass, pretty good and fully-exposed portraits in from twenty to thirty seconds, and landscapes, with an $\frac{f}{20}$ stop, in much about the same time.

From some experiments made with fuming the plates previous to exposure we are led to hope that in that way much greater sensitiveness may be obtained; but our results require confirmation before we can speak positively on that point. We shall, however, continue the experiments, and in the meantime hope to hear that the question of the preparation of sensitive plates by daylight has not been again allowed to drop out of sight until carefully tried and its faults brought to light and condemned, or its advantages made manifest and adopted.

## TOURIST PHOTOGRAPHY.

As a conclusion to the remarks we made upon this subject last week it is our intention now to offer a few hints upon the tourist's work out of doors, with a view to assisting our younger readers to the simplest and least laborious system.

Supposing the plates to be prepared and packed there are still many small additions to be made to the apparatus which are not needed for a short excursion. The apparatus must be overhauled in order to see that everything is in its place, as it is excessively annoying to find two or three hundred miles from home that your lens is still screwed on to your copying camera where you last used it, or that the tripod head is missing, no one knows where. In order to guard against this class of evil, and at the same time to make a sort of preliminary trial of the plates, it is well to have a rehearsal in the shape of a short expedition a day or two before leaving home. If, from lack of time, this be impracticable, the operation of exposing a plate should be gone through, noting carefully the

presence of each separate piece of the apparatus. This done, the extras must be looked to, but these will be found noticed under their respective divisions.

A few words may be said on the subject of dress; we mean the most comfortable irrespective of fashion. It will be borne in mind that the object in view is to be prepared for heat as well as cold, in addition to a good deal of wet weather usually experienced in hilly districts; also that as pedestrianism is to be the chief mode of locomotion it is necessary to make the clothing as slightly as possible a burden. A tolerably-dark tweed suit, with a hat known as "wide-awake," will prove very good externally, while we should recommend thin flannel next the skin, for the double purpose of warmth if the weather be cold and absorption of the perspiration if it be hot. The most important part of the dress, however, is the foot-gear, more especially to those who are unaccustomed to much walking. By all means let the stockings be of wool, as fine and soft as can be obtained; it is a serious mistake to use for this purpose, on account of their lightness, thin cotton or merino socks; one single day's experience with the latter will be quite sufficient. Let the boots or shoes, whichever may be preferred, fit easily and comfortably, but above all let them be stoutly soled; for a day's work over rough mountain roads will cause great disinclination on the part of the unaccustomed pedestrian to repeat the dose. To the above may be added a light mackintosh coat; this will be found very light, will serve as a focussing cloth, and is ready at a moment's notice in case of a sudden shower.

As regards the distance which may be covered in one day we should advise young photographers to pay no attention to it. Success does not depend upon their doing thirty or thirty-five miles a day; but rather the contrary. Again: one who is not in the habit of walking much would in all probability knock himself up in the course of a couple of days were he to attempt even half that distance. The best plan is to "take things easy" at first. Never mind if you do not get a mile away from headquarters the first day or two; you will find yourself in better condition for longer journeys afterwards.

We presume that before leaving home the intending tourist has settled in his mind whether he intends staying amongst friends, or whether his tent will be pitched amongst hotels and strangers; also whether his headquarters will be stationary or movable. Upon these two points will depend to a great extent the amount of work to be turned out, and also whether the negatives are to be developed *en route* or kept until the return home. It is advisable to develope at least one plate of each day's exposure, storing away the remainder for future development. It has been a much-disputed question as to whether it is safe to keep a plate after exposure; but we think there cannot be the slightest doubt upon the point now. We have known emulsion plates, certainly, which if developed within a few hours of exposure gave results which were all that could be desired, while in the course of a week or ten days not a trace of the finer details could be obtained. But why was this? Simply because the emulsion contained a large excess of soluble bromide, which was not washed out of the film, and by its presence quickly destroyed the latent image. We have noticed a similar effect produced by the presence of acid in the dried film. But nowadays, when an emulsion can be produced containing no trace of soluble matter, little fear need occur that the image will not keep for at least a few weeks.

On the whole it is preferable, as we said before, to take our developing solutions with us, and as these occupy but little space we thus place ourselves with slight trouble in a position to avail ourselves of any favourable circumstances which may turn up. It is not, unfortunately, the developing solutions which form the greatest obstacle to development *en route*; it is the difficulty experienced in obtaining a suitable place to perform the operation. Some adopt the expedient of making a dark room of the bedroom by nailing the bed clothes over the window. This is troublesome at first, but gives the maximum of comfort. It has the drawback, however, that in going from hotel to hotel it is impossible to reckon with any certainty upon being able to cover the window at all; and, to make matters worse, in the new-fashioned hotels, not content with windows of an immense size, the architect succeeds in cramming two or even three into one room.

If by chance it can be ascertained previously what will be the surrounding circumstances it is, of course, easy to so arrange as to make the most of them. As, for instance, if you should happen to learn the size of the window it will save much trouble to provide a double thickness of black calico sufficiently large to cover it; or, if you find that the house contains a convenient lumber closet, it is only necessary to make arrangements for its use during your stay. We have developed wet and dry plates in the beer-cellars of various hotels, and in the store-loft of a little country farm-house, using in the latter case a board laid across two oatmeal barrels in place of a table. The most uncomfortable "room" we have ever found was an old bathing van at one of our watering places; the walls had to be hung round with borrowed bathing dresses, and the development performed in a kneeling posture.

A tent is a very great convenience, as we can testify, when the onus of moving it about falls upon some one else. We had the pleasure some years ago of staying at the same hotel as a well-known wet-plate amateur, and of making several excursions with him, developing our dry plates in his tent after our return to the hotel in the evening. Under such circumstances we found the tent most acceptable, but it would have formed a serious addition to our ordinary *impedimenta*. The newer Howard's tent, however, is much more portable, though, perhaps, less convenient, and we have no doubt that with one of those handy articles and an ordinary bucket the daily work of development might be easily got through.

But it is time we turned our attention to the operation of development and the appliances and solutions necessary. Presuming that a darkened room has been secured, the first necessity is a suitable source of illumination. This is most easily supplied by the bedroom candle; but, as in the majority of hotels nowadays the candles supplied are either of stearine or paraffine, both of which substances give a too powerful light, it will be necessary to form a sort of shade or lamp of non-actinic material. This is easily done by taking a piece of stout Bristol board, measuring $24 \times 12$ inches, or less if preferred, and making two cuts half-way through its thickness, so as to allow it to fold up to the dimensions of $12 \times 8$ inches, and forming when set up a sort of triangular lamp, one side of which must have an aperture about $8 \times 6$ inches cut in it, which is to be covered with orange tissue-paper. This framework placed round the candle forms an excellent lamp, and folds up so compactly as to occupy scarcely any space when not in use. An elastic band will keep it in position when being used.

The only other requirements are a developing-glass and four bottles, three of which are provided with dropping-tubes, and which contain solutions of pyro. in alcohol, bromide of potassium, and carbonate of ammonia, the fourth containing methylated alcohol. A small quantity of strong liquid ammonia may be added if it be thought proper, and also two or three weighed packets of carbonate in a stoppered bottle. These, with a small sponge for removing the backing and a few strips of blotting-paper, form the whole of the apparatus necessary.

Any plates which may be carried home undeveloped will require some distinctive mark for reference as to exposure, &c.; and for this purpose the backing proves very useful, as it takes with great facility the impression of a pencil or other instrument. In case the plates are without backing it is a good plan to carry with you a box of small adhesive labels which may be attached *after* exposure. We say "*after*," because if attached previous to the exposure they are liable to leave an impression arising from their action on the reflective surface of the glass.

It is quite unnecessary to fix the negatives until the return home; and in the case of a difficulty in intensification we prefer to leave that until we return to the comforts of our own operating-room. In the latter case it is, of course, necessary to wash well, and preserve from the action of light, though if the detail be out the plate may be intensified after fixing, when it is quite immaterial whether it be kept from the light or not.

In conclusion: we should strongly recommend that, if the development appear irksome or a tendency to hurry over it without care be experienced, let it be left over. Rather keep the plates until the surroundings of your own familiar "den" be again about you, for nothing has so disquieting an effect on some minds as the simple change from one place to another which is unfamiliar. The same advice may likewise be given with regard to the exposure of the plates. If that cease to be a pleasure the interest is gone, and but little chance of good work remains. The probability is that overwork in the one direction is the cause, so lay the camera aside and get out the fishing-rod; or, if not apt at casting a fly, try a scramble up the nearest mountain, or a botanising expedition, or, failing other amusements, a little flirtation; we can warrant that it will not be long before the desire for the old amusement returns.

## SPIRIT PHOTOGRAPHY: THE LATE TRIAL.

In our issue of the 25th ult. we gave a brief account of the trial and conviction of Buguet, the Parisian "spirit" photographer, and of others who were alleged to have been aiders and abettors of the fraud for which Buguet is now undergoing incarceration. Since that time we have received full and apparently reliable reports of the trial, which in several respects was a most extraordinary one.

Of the guilt of Buguet no one whatever could reasonably entertain a doubt. He was caught "red handed," confessed that he had led a fraudulent career, had practised a successful *rôle* of deception, and, moreover, had yielded up to the authorities the original figures or marionettes from which he had produced the portraits of the deceased relatives of his numerous sitters. Yet, notwithstanding the plainness of the case against Buguet, there are many, both in France and in this country, who still believe in him as one who has obtained genuine spirit photographs, but that for some reasons, rather occult at present, Buguet has confessed to crimes of which he was not guilty. Among this class is Mr. S. C. Hall, F.S.A., who at a spiritualistic meeting a few days ago affirmed in the most unmistakable manner the perfect genuineness of a spirit portrait of his father which was taken by Buguet, when in London last summer, under circumstances which precluded the possibility of fraud.

From all that we can hear and read we conclude that it is pretty generally believed among spiritualists that Buguet was bribed to confess that he was acting as an impostor throughout, whereas, they say, in reality he was able to, and did, obtain many genuine spirit photographs, eking them out with spurious ones manufactured by aid of the marionette or mannikin figures to which we have alluded. This, we say, is a prevalent belief; and a warrant for indulging in it is claimed as well from the identification of several of the spirit forms with the deceased persons whose "counterfeit presentments" they purport to be, as from the farther alleged fact that Buguet had manufactured, or caused to be manufactured, nearly all the little figures produced at the trial between the dates of his apprehension and his trial, he having been at liberty during that time. However, no one seems to regret that he has received the punishment meted out to him, namely, imprisonment for twelve months. The fear seems to be in the other direction, viz., in his being dismissed from "durance vile" after a few weeks', if not days', captivity, instead of being punished in fact as well as in name, and serving the full period of his sentence.

But in the case of Leymarie the matter assumes quite another aspect. He, the editor of *Le Revue Spirite*, and a strong believer in the truth of spiritualism, looked upon spirit photographs as additional proofs of the reality of spirit communication, and wrote much with regard to this subject in the journal under his control. Even Buguet had never alleged that Leymarie so much as obtained any commission on portraits taken by his recommendation; and it was duly put in as evidence that Leymarie—just as Mr. William Crookes, Mr. W. H. Harrison, and numerous others in this country, not unacquainted with photography, had done—had seen the photographic operations performed without being able to discover any trickery, and, after this *deceptio visûs*, had assumed them to be genuine, and as such had written about them in good faith.

This is really the *gravamen* of the charge against Leymarie, who, however, received the same sentence as the self-convicted impostor Buguet. The *bonâ fides* of the editor in his relations with the photographer was shown by letters in Buguet's own writing up to the day before the arrest; but the presiding judge appears to have been determined upon stamping out the new and apparently unpopular belief. There is now and then something unfavourable said with regard to the conduct of the judges in this country, but what would be said in England of an occupant of the judicial bench who would taunt a man on his trial with having at one period of his life been a tailor who was unsuccessful in business, and inquiring how he came to discontinue the sale of coats in order to attach himself to spiritual literature? Or who, as the President did,* could so descend, in the performance of the duties of his high office, to carry on the following altercation?—"You succeeded in convincing spiritualists that these photographs were produced by spirits, which is false?" *Leymarie:* "I believe it." *Judge:* "You often went to Buguet's?" *Leymarie:* "Yes." *Judge:* "You ought to have found out what his process was." *Leymarie:* I did not believe he had any process; I did not suspect him; I could not go to him as an inquisitor."

Altogether the process of examination so conducted is one of the most extraordinary of which we have ever heard. The unsupported statements of Buguet, who seemed to be admitted as a sort of "king's evidence," appeared to carry greater weight with the judge than those of all the witnesses on the other side. For example: when Comte de Bullet gave his testimony, which was favourable to spirit photography, he said:—"I positively recognised the portrait of my sister. I am perfectly convinced that it is my sister." *President:* "But you have just been shown the head by means of which the image was obtained." *Comte:* "It was not the same." *President:* "Here is the head by means of which the portrait of your sister was obtained." *Witness:* "No, that is not like my sister." *President:* "Sir, it is to be feared that you are the dupe of your hallucinations and of your ideas." And soforth with other witnesses, between some of whom and the president several smart passages occurred, as in M. De Veh's evidence, when he spoke of having repeatedly seen spirits, the judge said—"You may, perhaps, have seen something, but not a spirit." *Witness:* "'Perhaps' means nothing according to law. You, Mr. President, do not believe in spirits; I believe in them because I have seen them. If I had not seen them I should be making a fool of myself. But, before judging, one should endeavour to see for oneself" (applause).

We have already spoken of the sentences. Buguet has accepted his, but Leymarie has appealed to the *Cour d'Appel.* What invests this trial with a certain degree of interest, apart from the merits of the case, is that it is said to have been instigated and influenced by a powerful religio-politico body or society which is exceedingly hostile to the new faith. A curious thing in connection with the trial was that, after sentence had been pronounced, the prisoners quietly left the court like other spectators, the custom being in such cases for persons in their situation to take a fortnight to arrange their business and then to present themselves at the prison in order to undergo their term of incarceration.

We re-echo the sentiments of every photographer in this country as well as in France when we express our unqualified aquiescence in the sentence passed upon Buguet. Of Leymarie's case something more will be heard.

Since the publication of Mr. H. J. Newton's paper in our number of the 2nd instant we have made a few experiments in the direction indicated by him, but principally with the new form of intensifier he recommends. The first point we discover in Mr. Newton's paper is the statement that the albumen substratum he uses never in his hands causes blisters. This we are quite prepared to believe, having used carbolic acid ourselves for the preservation of albumen for some years; still we think the freedom from blisters arises rather from the proper treatment of the albumenised surface than from any particular virtue possessed by the acid. We are aware that acetic acid used for

* *Spiritualist, page* 308.

the same purpose has been blamed for producing a similar result, but we have never been able to trace it to such a source. We have had blisters occasionally when using a substratum preserved with ammonia, and also with a freshly-prepared solution of plain albumen, but we have always attributed the defect to the presence of traces of moisture on the albumenised surface. We have never experienced any trouble when the albumenised plate has been gently heated a short time previous to coating with collodion. Mr. Newton's remarks in connection with bromide of magnesium entirely coincide with our own experience with that salt some years ago. In the anticipation of forming a collodion which should be ready for use as soon as made we substituted the magnesium salt for the bromide of cadmium; but the result, though eminently satisfactory as far as the structural quality of the film was concerned, was almost a total failure as regards the object we had in view. This we are inclined to lay to the charge of impurities or, at the least, uncertainties in the composition of the salt; for, out of three samples we obtained, the appearance and physical properties were distinctly different. The sample which succeeded best was much less deliquescent and possessed a more crystalline appearance than the other two. We have followed Mr. Newton's experiments with a commercial sample obtained recently, but can see no reason to alter the opinions previously expressed. The main object in our experiments was, however, to test the plan of development and intensification given by Mr. Newton, and this we have done somewhat fully. At page 316, when making some remarks on this subject, we expressed doubts as to the correctness of Mr. Newton's statement that an aqueous solution of pyrogallic acid might be employed over and over again without losing its strength. We now state, as the result of careful experiment, that so short a period as eighteen hours is quite sufficient to show a very marked difference between an old solution and one freshly prepared. Then, again: the plain pyro. solution does not suit all samples of pyroxyline when employed in the form of emulsions, though some samples will give an image readily enough, the quantity of silver used and the length of time the excess is allowed to act appearing to have a great influence on the result. The pyro. and tannin intensifier we can speak of very favourably, though we have had to employ a much greater quantity of acetic acid than Mr. Newton would seem to indicate; indeed, for safety's sake, we prefer to use a certain quantity of citric acid—say two grains of citric and half-a-drachm of acetic acid to each ounce of six-grain pyro. solution. When thus restrained the intensification proceeds with rapidity and regularity, the deposit being of a rich brownish-black colour, forming half-tones of the greatest delicacy and showing no tendency to fog or stains. We have tried this method in connection with washed emulsion plates with quite as favourable results, and believe it to be a step in advance. We should observe here that we have not tried the two preservatives recommended by Mr. Newton, having previously experimented with similar mixtures without deriving any special benefit therefrom.

## WASHING OF PRINTS.

A good deal of attention has lately been attracted to the subject of the washing of paper prints in connection with the prevention of fading. More especially it has been proposed to obviate the necessity of a thorough washing by treating the prints with certain metallic solutions. Lead solution has attracted most attention, and also, though to a less extent, barium nitrate and aluminium nitrate.

The theory of this system appears to be that as it is difficult to dissolve out the last portions of sodium hyposulphite it will be better to convert it into an insoluble hyposulphite, and so let the print contain a certain quantity of lead or barium hyposulphite instead of an equivalent quantity of the sodium salt (or, rather, instead of a much *less* quantity of the sodium salt, because it is expected by the new method to shorten the washing and diminish materially the quantity of water needed). This, undoubtedly, is a correct statement of the principle. If the intention was to completely remove by washing, it would, of course, be easier to wash out the very soluble sodium salt than the sparingly soluble lead or barium salt. Neither can it be supposed that the application of lead or barium solution destroys the hyposulphite, since the hyposulphurous acid is equally present in either case.

The question next arises—Are the lead and barium salts of hyposulphurous acid more stable than the sodium salt? Their being less soluble is something in their favour; but there is no other *a priori* reason for inferring such greater stability, and it does not appear that those who have advocated this plan have attempted to show the existence of any special permanence. Lead, which has been principally recommended, is not a base remarkable for the stability of its salts.

With barium the case seemed somewhat more hopeful, especially in view of a statement by Herschel, who affirms that barium hyposulphite is "soluble in hydrochloric acid without decomposition, no sulphur being separated.*" This seemed a very important matter. A hyposulphite capable of resisting the action of hydrochloric acid would possess a most remarkable stability far exceeding that of the sodium salt, and the presence of such a substance in a silver print would be undoubtedly very much less objectionable than that of sodium hyposulphite.

It did not seem safe, however, to rely upon anything short of direct examination. For this purpose barium hyposulphite was expressly prepared, was washed with extreme care, brought into solution in water by boiling, and a few drops of hydrochloric acid added. An immediate cloudiness indicated decomposition.

Lest the heat applied should have had something to do with this, another portion of the barium salt was left under water acidulated with hydrochloric acid. In a few minutes the water was milky, and in an hour or two the white crystalline powder of barium hyposulphite was converted into a yellowish amorphous powder. This was filtered out, washed, and dried. A portion placed on platinum foil, and heated, melted, turned red, and burned with a blue flame—was, therefore, sulphur; consequently barium hyprosulphite does not resist the decomposing action of hydrochloric acid, and has no claims to exceptional stability. I also dissolved a small quantity of silver salt in excess of sodium hyposulphite, divided into two portions, and added to the one lead acetate, to the other barium chloride, and filtered. The precipitate on the filter remained exposed to the air, and in both cases turned brownish—the barium compound the most so.

Without undertaking to express too positive an opinion on this mode of treatment, the results just described certainly do not look very favourable. There also seems to be a danger that it will be relied upon by those who may use it, to the extent of greatly diminishing the washing, and so leave, not a mere trace, but a much larger quantity of hyposulphite in the paper.

It is certain that a good honest washing will take the whole of the hyposulphite of soda out of the paper and make the print safe. Washing my own prints with reasonable care, I have never had a single instance of fading. Neither has this depended upon any particular mode of operating, of preparing paper, of toning, or of fixing. As to the modes of toning, there seems but little choice as respects permanence. More than thirteen years ago I made a very extended series of trials in this direction; I toned prints in the most varied manners, cut them up, and subjected them to various tests for permanence. As all these specimens of results were carefully pasted into my note-books and registered, it follows that, after this interval of time, the pieces which were *not* subjected to any destructive agency, but were preserved for comparison with those which had been, have now themselves acquired an interest, as showing how they have withstood thirteen years' keeping.

For example: one print was cut up and portions toned as follows:—1. With benzoic toning bath, which I have elsewhere described. 2. With citrate toning bath (Hardwich's). 3. Sulphur toning (hyposulphite mixed with lead chloride one day previous). 4. Hyposulphite and gold toning. Result at the end of thirteen years: all in good condition except the sulphur-toning, which, as was to be expected, has turned yellow. At that time some one had highly recommended a toning of hyposulphite, gold, and lead chloride, or Nos. 3 and 4 (above) mixed. Several specimens were toned in that way; all (as was to be expected) have faded much, though not so utterly yellow as where the gold was omitted.

And here I may remark that amongst the cleanest and brightest-looking of my specimens are those toned and fixed with hyposulphite and gold. I have always, however, considered this a dangerous method, because it requires to be managed so conscientiously. If done *exactly* as follows, and only a limited number of prints operated on, it seems very safe:—To each sixteen ounces of water take *four ounces* of hyposulphite and *two grains* of gold chloride. The hyposulphite is to be dissolved in hot water and the gold added at once, and used two or three hours after mixing.

I do not wish to be understood as recommending this method, but only as giving what appear to be the best conditions for its use. It

* Cited in *Storer's Dict.* (p. 312), from *Ed. Phil. Jour.*, 1819, I., 20.

is certainly true that prints toned and fixed in a fresh mixture of this sort have with me kept thirteen years without the slightest change. They were, of course, thoroughly washed. I presume that this toning and fixing bath would be no longer safe the day after mixing, and that if many prints were fixed in it even when fresh there might be danger. The safety, so far as it exists, depends upon the bath being strong in hyposulphite and in not sparing the gold. This method is also troublesome in giving sometimes coppery tones without any evident reason. The specimens in my note-book resemble in tone those got with the ordinary toning baths. Nevertheless I altogether prefer the acetate toning or the benzoate (if there be any choice the latter is the better); and *in any case* a most thorough washing is needed.

At one time it was imagined that prints could be washed by throwing them into a large tub, into which water trickled at one end and flowed over at the other; but now it is pretty generally understood that a *continual and complete change* is necessary. If, for example, some pieces of sized paper be coloured with some intensely-coloured dye, and be thrown into a vessel of water into which water flows and overflows, it will be found that an exceedingly long time is necessary to get rid of the colour; but if each piece be taken and thrown into the vessel of water separately—if then the water be completely emptied off, filled, and emptied again—we shall find that we soon have got clear of the coloured water that adhered to the surface. This, in fact, can be done in three minutes or less by rapid and complete changing, whereas in the other way hours would have been necessary. The next step is to get out the solution with which the body of the paper is soaked, and this needs time. *Filtering paper* can be washed clean in a few seconds, because we have only the capillarity of the film to conquer; but sized paper is virtually a membrane, water does not freely penetrate it, and the solution which it contains can only be got out by exosmose. And, further, the albumen film increases the difficulty; so that to finish the operation a certain amount of soaking, with occasional complete changes of water, is necessary.

No system of washing, therefore, gives a reasonable assurance of permanence, except where it is arranged that at intervals the tank shall be emptied to the bottom. But even with this no washing can be fairly done when every gallon is an object to save. No professional photographer does justice to those who buy his prints if he place himself where his supply of water is limited or involves troublesome carrying; there will be too much temptation to cut short the washing. The experience of a whole generation warrants us in saying that when prints fade the photographer is always to blame. The system of operation necessary to produce permanent prints has been so completely studied out, and has been made for many years past so very clear to all who read photographic literature, that faded prints are no longer excusable. And it is certain that a vast gain in permanence has been made in the last ten years as respects the prints offered for sale. I have bought largely of photographic prints in the different cities of Europe at various times, and have found the improvement in these late years as to permanence well marked.

In fact, those who deal in photographs soon learn to discriminate for their own protection. It will often happen that photographs remain on their hands for long periods unsold, and if these fade or turn yellow the dealer takes good care to avoid the photographer who made them in future, and in this way, as I have been told—"We do not keep ——'s photographs for sale; we have lost too much by having them fade on our hands." Meantime the maker, knowing that his negatives are good, wonders why another's work, apparently no better, is preferred to his, and drives it out of the market; so that the buyer receives an indirect but valuable protection, and gets prints that at least will not immediately fade.

I enclose you herewith a specimen of a precipitate obtained by treating barium hyposulphite with cold, very dilute hydrochloric acid. As this precipitate consists chiefly of sulphur, you will be enabled to judge of the power of that compound to resist decomposition by acid. I have not thought it worth while to send a corresponding specimen from lead hyposulphite, because the easy decomposition of that compound has never been doubted, whereas for the barium salt an exceptional stability has been claimed. M. Carey Lea.

## "THE CONTINUATING ACTION OF THE LIGHT."

It has been found that a piece of carbon tissue which has been insufficiently exposed beneath a negative to yield a perfect proof upon immediate development, will yield such a proof if the development be postponed for a certain (or uncertain) length of time; in fact, that the "insolublising" action started in the light is continued in the dark. What the continuing—or, as our writers will have it, "continuating"—agent may be is as yet a question. Various opinions have been given, but no proof has thus far been advanced. The strangest of these opinions is that the action in question is an action "of the light"—an opinion in which two distinct assumptions are involved, viz., that in a well-closed box there may be light, and that this light is capable of photographic action. I might even go further and say there is a third assumption, viz., that the photographic action of this light is of a kind capable only of carrying on a kind of work action which has already been begun.

"Inquiring into the pedigree of an idea," says a distinguished writer,* "is not a bad means of roughly estimating its value." Let us, then, inquire into the pedigree of this idea. Mr. Batho is not certain of the date when its promulgation first began, but says that Mr. Johnson gave it in the beginning of 1870 as an explanation of the apparent over-exposure of certain prints which he then developed at a meeting of one of the metropolitan societies.

I do not find on reference that this statement is borne out, Mr. Johnson's observation being that "there was always a certain *amount*" (he does not say a certain *kind)* "of action going on in the dark."† Of the *amount* of action there has been expressed no doubt. It is of the *kind* whereon the difference has arisen. Is it an action "of the light?" "That is the question," and "thereby hangs a tale." Mr. Henderson, indeed, employed the phrase, "a continuation of the action of the light."‡ The phrase, however, is ambiguous, not precise, and may be construed as fairly into meaning that the action started by the light is continued by some unknown "what" as that the continued action is an action "of the light." It is not unreasonable to suppose that anyone deliberately promulgating so novel an idea as that an action taking place in what we call "the dark,"§ is in reality an action "of the light" would endeavour to substantiate his notion by some argument or evidence. No such argument or evidence, however, appears to have been advanced at the meeting in question; and in these circumstances it seems to me we are not justified upon the strength of an ambiguous phrase in fixing upon this date as that at which the idea first began that the continued action is an action "of the light."

Mr. Batho goes on to tell us *(ante,* page 148) that in the latter part of the year 1871 "Lieutenant Abney practically reduced the exposure of his carbon tissue to one quarter, he then saying that with half the usual exposure eighteen hours in the dark was sufficient to bring the print up to the full vigour, and with twenty-four hours in the dark one quarter the exposure would be enough." "Substantially," he continues, "this is what has lead to the belief that the light continues *its* action in the dark."

I have, unfortunately, not been able to find Lieutenant Abney's paper "at the latter end of 1871,"‖ and cannot therefore see what he actually has said; but so far as Mr. Batho quotes him there is no intimation that he consides the "continuating" action to be an action "of the light." I must then join issue with my friend in his belief that the evidence he has given is substantially "what has led to the belief that the light continues *its* action in the dark," Mr. Johnson not having on the occasion named used the words ascribed to him, and Lieutenant Abney's words (as quoted by my friend) not being open to the construction he has placed upon them. It is clear that the idea has originated somehow, but that it has originated in the way described I think I have shown to be clearly incorrect. Let us, then, seek further for our pedigree.

In The British Journal Photographic Almanac for 1872 (page 115) there is an article by Mr. Johnson on *Actinic Action in Darkness.* The expression here made use of is again ambiguous, leaning, if anything, to the idea that the continuating action *is* an action "of the light." In his opening paragraph Mr. Johnson says:—"It is evident that the action set up by exposure to light does not cease after the print has been withdrawn from that action, but is continued in absolute darkness." Grammatically considered the sentence is absurd; for if, after the print has been *withdrawn* from a certain "action" "that action" does not cease, manifestly "that action" can no further influence the print which has been withdrawn therefrom. Accepting, however, the construction which Mr. Johnson evidently intended to be placed upon his words, the sentence I have quoted does not commit its author to the opinion that the "continuating" action is an action "of the light;" nor is there a single sentence in his article which does. Indeed, far from dogmatising on

* Mr. Herbert Spencer on the *Nebular Hypothesis.*

† Ibid. ‡ 1870, p. 187.

§ Perhaps it will prevent a little longitudinal capillary subdivision if I remark that I am not unaware of the existence of invisible chemical rays.

‖ Why do not writers give more frequent references?

the point, Mr. Johnson expressly asks—"What is the exact nature of the action thus set up and thus continued?" At a later date Mr. Baden Pritchard makes allusion to "continuating" action,* but does not imply or directly describe it as an action "of the light." At a still later date than this Lieut. Abney and Mr. Henderson both make mention of "continuating" action,† the latter describing it as the "*automatic* action of the light," whatever he may mean by that. So far, unless Mr. Henderson's curious remark can be considered in that light, no one has stated his belief that the "continuating" action is an action "of the light," much less has any one advanced a single figment of evidence for regarding it as such.

Going on, however, to yet a later date, we find an editorial article‡ on *Lieutenant Abney's Spectroscopic Observations in Connection with the Carbon Process.* In this article the "continuating" action is described not as an action "of the light," but as an "action that goes on in darkness."§ The article, however, proceeds to describe an entirely different thing, viz., the alleged "continuating" action of *certain coloured rays.* This "continuating" action, assuming its existence to be proved, clearly is a "continuating action of the light."

Unless my friend Mr. Batho can definitely father the idea on some one else, I think we must conclude that he has mixed up *this* continuating action in his mind with *that,* and applied to *that* an appellation which should be confined to *this.* At anyrate, what my friend regarded as a generally-entertained opinion seems to be an opinion not entertained at all, and the illusion with which he reluctantly placed himself in combat would seem to be an illusion called into existence by himself. I have described the idea that the "continuating" action is an action "of the light" as an idea unworthy in the present state of matters to be entertained||—not, however, in the bombastic and inflated style which has been ascribed to me,¶ but on the ground that its presentation has been accompanied by no evidence.** I have traced the pedigree of this opinion. Nobody claims relationship with it. Like Topsy, it has "growed." "It never had a father, and it never had a mother; in fact, it's nobody's child." Applying Mr. Spencer's test, an idea which has no foundation is one in which we may expect to find no value.

But let us form an estimate of this matter on its merits. Mr. Batho always understood "continuating action" to imply the operation of light which had "become, in a manner, latent."†† What is latent light? I never heard of it before, and fail to find it mentioned anywhere. If it be akin to latent heat (and our author points to its relationship) then its capacity for action is further withheld.

The heat which is necessary for melting ice is required to keep it in the molten state, and cannot, whilst that molten state prevails, be utilised for melting more, otherwise we should be able to do an infinite amount of work with a finite amount of energy. And so with "latent light." If light be latent it is because it is unavailable for further work, and how, then, shall we attribute to such light the further work performed? My friend is of the opinion that in certain circumstances the latent theory of light would not be a bad one.‡‡ My own idea is that there are no circumstances in which it would be otherwise.

There is just one view in which the continuating action may without absurdity be regarded as an action "of the light," and that is in the supposition that something analogous to *fluorescence* §§ of the dark actinic rays takes place.

I have in my possession now a volume in which I was wont some years ago to place my proofs on coming from the printing-frame. Some proofs remain there still, though several years have now elapsed since they were taken from the frames. Some sort of action has gone on and they are dark all over, the image being only faintly seen; but standing boldly out in bronze upon the blackened ground are the letters of the page. Whatever action has gone on has been localised in its intensity. We might assume a temporary absorption of actinic rays and their subsequent radiant removal, as a poker in the fire absorbs the heat, which, when removed, it radiates again.

I have endeavoured to reduce the matter to experiment by placing an open volume for several hours in the sun, and then leaving it closed up with sensitised paper on the page. Three weeks have now elapsed and no characters can be seen. In another and less questionable experiment I have met with more success. Certain tubes prepared in France can be procured from our opticians here. The tubes are made of glass, sealed hermetically, and filled with greyish powders, which are said to be sulphides of the alkaline and alkaline earthy metals. If these tubes are exposed for a few moments to the light of day, and then taken into a room from which the light is carefully shut out, they are seen to be aglow with splendid colours, comparable in intensity and kind with the colours of the Geissler tubes. It occurred to me to try if they were capable of inducing photographic action, and I found that the one emitting purple light when held for three minutes at a distance of the eighth part of an inch from a sensitised collodion plate yielded an impression capable of easy development into an image of intensity.

It is quite conceivable that there are substances capable after being exposed to light of emitting a *dark* radiance having the power of inducing photographic action, and it is also conceivable that in a carbon film such substances exist; but until it has been shown that both these possibilities are facts, seeing that the "continuating" action may be accounted for by the operation of causes which are, I think we must conclude that there is as yet no grounds for the inference that the "continuating" action is an action "of the light."

If I have hit my friend a little hard I hope he will not take the hitting ill. Correction does not mean contempt. When for the public good illustrious Brutus wet his dagger in great Ceasar's blood, he loved him more than ever he loved man beside.

D. Winstanley.

* 1872, p. 89. † 1872, p. 175. ‡ June 14, 1872.
§ P. 275. || *Ante*, p. 236. ¶ P. 311. ** P. 236. †† P. 269.
‡‡ P. 269. §§ A very different thing from "latency."

## FOREIGN NOTES AND NEWS.

Portraits Taken with Sell's Light.—Mayr and Fessler's Negative Retouching Paper.—Schultz Sellack's Paper.—Seitz's New Gelatine.—The Paper Calamity.—Exhibition of Lithographs from Photomicrographs, by Dr. Schimann, of Berlin.—An Automatic Apparatus for Sensitising Collodion Plates.—Development by Ammonia Vapour.—M. Gaillard's Preservative.—Honours to a Photographer.

At the last meeting of the Photographic Society of Vienna several negatives and portraits taken by Dr. Schimann with the *sulphide of carbon nitrous oxide gas light,* but not with an original Sell lamp, were exhibited. The portraits were examined with great interest.

A number of cabinet-sized sheets of Mayer and Fessler's negative retouching paper were distributed amongst the members for trial. The President said that this paper was uniform in texture and beautifully prepared compared to the ordinary stencil paper, and that similar paper is used, under the name of "*papier vegetal,*" in various processes—such as Vidal's chromophotography, Lambertype, &c.

A few sheets of paper, prepared by Dr. Schimann according to Dr. Schultz Sellack's directions, were then laid on the table. The paper was treated partly with bromide salt and partly with chloro-bromised salt, procured from Trapp and Münch, and contained the same proportion of salt as the ordinary albumenised paper of that firm. Dr. Schimann is of opinion that though fuming with ammonia is absolutely necessary to bring out the full brilliancy and rapidity of printing of this paper, yet it is not advisable to fumigate in a box containing fluid ammonia. His method is to spread finely-powdered carbonate of ammonia very equally over the surface of the cloth or felt at the back of the printing-frame. The ammonia being thus brought into direct contact with the paper at the time of printing penetrates it more readily, and exercises a substantial influence on the rapidity with which the image is developed and the brilliancy of tone produced.

The President showed some *lichtdrucks* by Brauneck and Mayer produced by a small press, which were very much admired. Arrangements were then made for the representation of the Society at the forthcoming exhibition in Philadelphia, and the remainder of the time of the meeting was occupied by purely local matters.

The library of the technical high school of Vienna has just received a series of Woodward's photomicrographs.

Professor Husnik reports unfavourably of Seitz's new gelatine for *lichtdruck.* He finds it unsuitable for *lichtdruck* purposes on account of its containing fatty substances, since it does not adhere well to the glass and spreads in printing.

The greater part of the albumenised paper used in this country is imported from the continent, but if matters go on there as they have been doing for some time there is every prospect of this state of matters being reversed, and of our paper being exported in ever-increasing quantities to Germany. For a considerable time back German photographers have been complaining loudly of what they call "the paper calamity," and lamenting over the increasing tendency of their paper manufacturers to stick to the old prices at

the cost of producing inferior goods—introducing chemicals which have a deteriorating effect on the rough paper from which the albumenised paper is prepared, and causing the cardboard used for mounting photographs to become rapidly yellow. It is this paper panic which was the immediate cause of the introduction of Kader's new paper, Herr Kader being of the opinion that a little wholesome competition might induce the manufacturers, who have hitherto had a monopoly of the article, to mend their ways. Dr. Schultz Sellack, on the contrary, thinks that a great deal may be done to improve the paper at present in the market; hence his new method, which has been discussed at every meeting of the Vienna and Berlin Photographic Societies for some time back.

Dr. Schimann, of Berlin, lately showed a number of highly-finished lithographs prepared by him from three photomicrographs. These beautiful photographs, which left nothing to be desired in point of sharpness, were produced by repeated enlargement with the lantern. At the conclusion of the exhibition Dr. Schimann spoke at length of the importance to science of such an easy and reliable means of reproducing direct photographs of microscopic objects as *lichtdruck*, and gave a sketch of the history of photomicrography. A full account of his address would be out of place in these columns, but an outline of it may be admissible.

Dr. Schimann said that the microscope has opened up a new and wide field in natural science, to which the expression "*multum in parvo*" is most applicable. The instrument has become indispensable to the naturalist. No day passes that new discoveries are not published in the scientific journals which have been arrived at by means of the microscope; but, though the results of microscopic investigation are made widely known, mere verbal descriptions can convey no adequate idea of a newly-found microscopic plant or animal, and as microscopic preparations are often very perishable much depends on their true pictorial representation. At first these pictures were laboriously drawn by hand, and the result was often idealised and almost always unreliable; besides this way tried the eyes severely, and all microscopists are not draughtsmen. Various appliances were invented from time to time for lightening this labour—such as Wollaston's *camera lucida* for the microscopic drawing of Amici, Oberhäuser's drawing apparatus with prisms for projecting the image upon paper, and so on. Lastly photography lent a helping hand, and the daguerreotype process was adapted to microscopic pictures. The first serviceable micro-daguerreotype was taken by Donné, in 1840. In 1845 Leon Foucault produced a series of pictures that served as a foundation for the copperplates of an atlas of the principal fluids. The introduction of the use of collodion into photography and the employment of albumenised paper gave a great impetus to photomicrography, by making it possible to reproduce microscopic images in great numbers, each copy as accurate as the first; and, more recently, the *lichtdruck* process has still further facilitated the illustration of scientific works by photomicrographs. The principal hindrance now to the production of photomicrographs is the diffusion of focus of the common microscopic objective and the time required to correct this fault, when it is possible to correct it, either by altering the position or by inserting various appliances constructed for this purpose.*

Dr. Schimann produced the photomicrographs from which his lithographs were taken in the following way:—The corrected, or perhaps over-corrected, lens was screwed on to the tube of the microscope without the eyepiece. The extending bag camera was held in a horseshoe-shaped form by means of a brass rod fixed to it, so that a screwing contrivance moved it at will into the rough focus and placed it vertically over the tube of the microscope so as to exclude the light. (Should it be necessary to lay the stand of the microscope in a horizontal position this camera with its long body will still be found useful.) The size of the picture produced depends upon the distance of the mirror from the objective. When the image is much enlarged twin lenses and condensers of direct sun or lime light is found indispensable.

A much more ingenious apparatus for taking photomicrograghs was shown some weeks ago by M. Aimé Girard, at a meeting of the Photographic Society of France, and described by Professor Stebbing in The British Journal of Photography.

M. Cordier describes in the *Journal de Photographie* a piece of apparatus which will be, to some extent, new in its uses to English readers, viz., an arrangement for keeping the silver bath in motion during the operation of sensitising the plate. Before describing this apparatus we must remind our readers that in France horizontal baths or dishes are almost exclusively used in place of the vertical baths in vogue here. If of any service in connection with the latter form of bath little difficulty would be found in modifying it so as to suit that purpose. The apparatus consists simply of a balance formed of a rod of iron, the upper part of which is bent and furnished with a small wheel either of wood or brass. A hole is pierced into the laboratory table through which the balance is suspended, the point of suspension being a little below the level of the table. The lower portion of the rod, which reaches nearly to the ground, carries a weight of about nine pounds (four kilos.), which, when set in motion, continues oscillating regularly and gently for about three minutes, or until the plate has had time to sensitise. When the balance is set in motion the bent upper portion of the rod rises and falls alternately above and below the surface of the table, thus communicating a rocking motion to the dish which rests upon it.

* It is scarcely necessary to remind our English readers that the microscopic objectives in use in this country are free from the faults hinted at by Dr. Schimann.—Eds.

The following details are given of M. Plucker's method of development by means of vapour of ammonia:—On a plate of glass or other suitable surface place ten or a dozen drops of ammonia, which must be rapidly spread with the finger; then take a plate which it is desired to develope, and breathe strongly upon its surface so as to soften the film, but not sufficiently to cause the breath to agglomerate in beads. The plate is then held over the ammonia vapour, being kept in motion in such a manner as to bring its whole surface equally within the action of the vapour. When the whole of the details are out the plate may be intensified at once in the usual way, or, if preferred, may be kept until more convenient. If carefully preserved from the effects of light and damp the partially-developed negative may be kept for months without injury. The plates with which this mode of development is recommended are prepared with the bath and bromo-iodised collodion, the following preservative, introduced some years ago by M. Gaillard, being employed:—Prepare separately two solutions, consisting respectively of tannin four parts to water sixty parts; and dextrine ten parts to water one hundred and forty parts. Pour No. 1 gradually, and with continual stirring, into No. 2, stopping occasionally to shake well. When mixed add ten parts of alcohol and filter; after a day or two the liquid will become quite clear, and then resembles beer.

The Academy of Sciences of Bordeaux have decreed to M. Terpereau their gold medal for "the beauty and utility of the photographs he has produced in the interests of art and industry." This is the highest honour the Academy can confer, and it is, moreover, the first time that photography has been admitted within the charmed circle of art.

## NOTES FROM THE NORTH.

There is always a pleasure in seeing a difficulty successfully overcome; and as a case of this kind which I saw a few days ago is likely to be occasionally met with by dry-plate workers a note of it may be of some use. One of my friends had been off on a holiday with his camera and a supply of beer and albumen plates, from all of which, with one exception, he had developed excellent negatives. That one exception, however, was a sore point, because, as usual, it was the picture for which he most longed, and to secure which had been mainly the cause that had induced him to select the locality to which he had proceeded. The subject certainly was not very promising, consisting as it did of a number of very bright white-washed cottages, rather picturesquely scattered on and contiguous to the banks of a rippling stream, and surrounded by pretty gardens and large trees in all the glory of early summer foliage. An exposure considered sufficient for even the deepest green was given, and as there was no wind and the atmospheric conditions were otherwise favourable, only one plate was exposed—a mistake, I think, which even the most successful dry-plate worker should not make whenever he is very anxious to secure any particular subject. I speak feelingly on this point, as until quite recently I knew my beer and albumen plates to be so certain that I could always rely on getting a dozen good negatives from every dozen exposed. But a few weeks ago I was employed to make negatives of certain old family residences in various parts of the country; and as, in addition to the pleasure of photographing the subjects, I was to be well paid for the work—a thing really quite new in my experience—I resolved to expose two plates on each subject, and I had no cause to regret the resolution. Not that there was any difference in the plates, each being as nearly as possible perfect, but the experience gained in the development of the first enabled me to make really a better negative of the second in each case.

To return, however, to the subject in hand. The plate was, as usual, treated first with alkaline development, under which the

white houses rapidly made their appearance, and a little later slight indications of their surroundings also showed. When the alkaline developer had apparently done all that it could it was washed off, and the plate treated with the usual acid pyro. and silver. Under this treatment the houses rapidly acquired intensity, becoming perfectly opaque—to such an extent, in fact, that the darker stones round the doors and windows became obliterated, while nothing but the faintest indication of the details of the rest of the picture was visible. The whole of the reduced silver seemed to be attracted by the houses, while not an atom was being added to the other parts; and even if at this stage the foliage, &c., could have been brought up, the picture would have been ruined by the complete opacity of the white walls. But my friend was unwilling to lose his picture, and, after much consideration and some little consultation with those whom he thought possessed larger experience in that kind of work, he tried the following plan with complete success:—

The already too intense houses were reduced to proper density by a strong solution of cyanide applied with a brush, and the plate washed and dried. It was then laid on a flat water bath, and when sufficiently warm the houses were covered with varnish, which dried quite bright. The intention was, of course, to protect the varnished portions from the action of the materials used in the subsequent part of the operation. When the varnish was quite dry the plate was moistened and flooded with a tolerably strong aqueous solution of iodine in iodide of potassium, and allowed to remain till the faint image was apparently completely converted into iodide of silver, when it was well washed and allowed to remain exposed to the light for an hour or two. At the end of that time it was again moistened, and the ordinary acid solution of pyro. and silver applied, the result of which was the rapid intensification of the previously feeble image into a really good printing negative. As the iodine had to a certain extent penetrated and coloured the varnish by which the houses were covered it had to be removed by a wash of alcohol, and the plate was then varnished in the ordinary way, the whole operation resulting in the production of a first-rate negative out of what certainly seemed at the commencement a very hopeless failure.

The troubles which afflict the landscape photographer, especially when he attempts to photograph large groups at a distance from home, are manifold, and yet it is astonishing how he generally manages to deliver himself from them. The following wrinkle may be of use to those who choose to make a note of it. At a picnic which recently took place at one of the many lovely spots which lie within an easy distance of Edinburgh there was present, as usual, the photographer, who seems to be considered quite as much a necessity as the hamper and the table cloth. The members present at this particular picnic had a notion that they were of a somewhat higher class than those of which such gatherings are generally composed, and the photographer had, and was quite aware of it, a reputation at least head and shoulders above that of his brethren of the camera generally, and, therefore, it behoved him to be on his mettle to do his very best, which, of course, was the best that could be done. With this object in view he looked with some suspicion on a tried and trusty bath in daily use, and preferred to make up a new one on the night previous to the picnic, which was mistake number one. It was tried, however, and supposed to be all right, and so he started with the party, fully confident of a gratifying success. In due course the company was grouped in the time-honoured fashion, with every eye staring into the lens, and in such a form as to utterly ignore every known law of good composition. Still that did not much matter, as of course every body wanted his or her face to be the best, and did not care a button about the appearance of any other person in the forthcoming picture; and so if all else had gone right the arrangement would have been considered perfect. After the usual period of impatient waiting the artist made his appearance, and in a few seconds the caution "now! steady!" was given and the cap removed. The light was excellent, and although the lens was stopped down an exposure of ten seconds was considered sufficient, and with a "thank ye, ye've done capitally!" our artist betook himself to his tent in full expectation of getting a high-class negative. Vain, however, was the expectation! No sooner had the developing solution been poured over the plate than the film was enveloped in one uncompromising mass of fog, and the photographer, after accusing first the camera and then the tent of letting in light, and finding that his accusation was unfounded, was constrained to admit that, although a new bath to which no acid had been added might work well in the cool of the evening, it was quite possible that the shaking contingent on a long journey and a temperature of 118° Fah. might slightly upset its powers of giving a clean, clear negative. But the photographer was one of those fellows whose vocabulary does not include the word "fail," and so, remembering that there was a jar of cucumbers and vinegar in the hamper, it was sought out and some of the vinegar added to the bath. This, again, was mistake number two, as he should have known that an acetous solution of what, I suppose, the chemist would call the active principles of the *cucumis sativus*, was much more likely to intensify than to cure the evil; and so, of course, it proved, as the second plate was, if possible, worse than the first. Our photographer, however, was far too shrewd a man to explain this to his sitters, and therefore he discoursed for a couple of minutes on the ascending and descending currents caused by the intensely-hot sun, and the injurious effects of the varying refractive power of the variously-heated parts of the atmosphere, concluding by a promise to make a "stunning" picture at a later period of the day. Having thus dismissed his somewhat impatient audience he despatched a messenger to a village some two miles distant, in the hope that the village "medicine man" might have some nitric acid. He then poured the rebellious bath into a porcelain dish and exposed it to the powerful rays of the sun, which, in a few minutes, turned it as black as ink, the colouring matter gradually settling at the bottom and leaving the bath quite clear. As soon as he considered the sun had done its work he borrowed from a lady a fine cambric handkerchief, and, having folded it several times, used it as a filter, through which, to his great joy, the bath passed quite bright. By this time the messenger had returned with a supply of the much-needed acid, and by the addition of a few drops of it to the bath it was found to be in first-rate working order; and a successful group was taken with it in the afternoon.

During the past few weeks the citizens of "Auld Reekie" have been "much exercised" by the appearance of a new style of cab which was being driven about in various parts of the city, and stopping from time to time in some of the most unlikely places if the picking up of "fares" were the driver's object. In general outline it was not unlike an ordinary cab, but instead of a door and window at each side windows only were there, the door being at the back; and altogether there was a lightness and trimness about the turn-out that could not fail to attract observation. As usual, opinions differed widely as to what it really was, but the experienced photographic eye could hardly fail to detect a photographic appearance about it inducing a desire to make the acquaintance of its owner. This was not a difficult thing to accomplish, for any one who chose to watch the vehicle for a short time soon recognised the jolly, genial, good-natured face of George Washington Wilson, of Aberdeen, emerge from round the corner with his slide under his arm, and at once perceive that he had, for a time at least, abandoned the little tent in which, on his knees, he had so long worshipped at the photographic shrine. To get into a chat on his favourite art with "G. W. W." is the easiest possible matter; for, although he is really a busy man, he is never in a hurry, and is always ready and willing to give a bit of advice or enjoy a little fun. The new dark room must, to a man like him, be of immense advantage—in the saving of time, if of nothing else—as whenever he has exposed his plate he can jump in, inform the driver from whence the next picture is to be taken, and carry on the process of development while the journey is in progress. Mr. Wilson spent some weeks in Edinburgh, and already we have the result in a volume, very recently published, of *Edinburgh and its Surroundings*, which just appears in the nick of time, when tourists do most abound. Of the merits of the pictures I need say nothing, as it is probable the Editors may find the volume on the "editorial table." All who are acquainted with Mr. Wilson's work—and I suppose that includes every man and woman of culture in the country—will easily understand that, both as regards technical excellence and pictorial selection, every picture is a perfect gem.

I am glad to see a practical man like Mr. Warnerke turning his attention to the claims that have been made on behalf of some of the methyl family as a means of shortening the exposure by improving the method of development, as I feel persuaded that is the proper direction in which to look for any material reduction. My experience, however, in the use of what has been called "methylal" is different from his, and I have, during the past few weeks, experimented largely with it and kindred compounds. The conclusions to which I have been led are that any apparent increase of detail produced by the developer containing mythylal is altogether due to the absence of restraining acid, and that when the methylal is perfectly free from acid the tendency to fogging is considerable. But when the process of distillation of it has been managed so as to

admit of a trace of sulphuric acid passing over with distillate the fogging tendency is altogether prevented. The most promising results I have obtained in this direction, although I am not in a position to say much about it yet, have been by the substitution of a quantity of *methyl-glycocine* for about seventy-five per cent. of the usual amount of acetic acid. By this means I think I have succeeded in getting clean and rapid development with much shorter exposures than with the ordinary developing solutions.

Methyl-glycocine ($C_3 H_7 NO_2$) may be readily made by boiling creatine with a solution of barium hydrate for some time, filtering the liquid, and passing through it a current of carbonic acid gas so long as a precipitate is formed. The solution is then filtered, and may be evaporated to the crystallising point, or kept as it is for addition to the developer. J. Nicol, Ph.D.

## OUR CLUB.

### No. VII.—The First Town.

We arrived at Alva—that picturesque little village at the foot of the Ochil Hills—and made this our starting-point, for the following reasons:—The population was over three thousand, and it boasted of three churches, three congregations, and consequently three ministers. It was a manufacturing town, and, trade being brisk, money was floating about pretty freely. And then the country seat of the "lord of the manor" was within easy walking distance. So you see, all things considered, it was not a bad place for a start. I mention the ministers and churches specially, because this was one of the leading features of our programme. In all towns which we visited we intended to call on the ministers personally, and, if possible, get them to sit for their portraits. If we were successful we would then have good samples printed, and engage the church officer to call on the members of the congregation with proof copies to sell from, of course allowing him a liberal discount for his trouble. By this means we expected to do a fair stroke of business.

We also calculated that a considerable sum could be netted out of the "country seat" by venturing on taking some negatives on the spot—good things, which would prove a favourable introduction of ourselves and our work. And then we had the villagers to do our best with, and the little bits of scenery all around, which folks came from far and near to see, we meant to turn to profit.

After dinner we took a walk round the village to see what it was like, and also to make a note of the various objects of interest. Like all other villages, at the first glance it was the old story of the town-hall and the public well; whilst the natives on their door-steps, wide-eyed and curious, were evidently discussing our appearance and points.

As we walked on, examining the back streets and penetrating into the various nooks and corners, many of the pictures brought to my mind a series of slides I had seen long ago, entitled *Scenes in our Village*. We came upon the village smithy, and there at the entrance stood that same old horse that's always standing at the smithy door waiting his turn, and as we looked we wondered if that old horse stood there for ever, just for the sake of making the picture. The country clown with his big hobnailed boots sits on the stool by the side of the door, swinging his feet and keeping time in a sort of tune to the pendulum motion of his legs, whilst the "clank, clank, clank" of the old smith's hammer keeps sounding in the air. Then we come upon the wheelwright, who, to make his last job look pretty, is painting it in a quiet, sober *red*. His Jeanie stands there watching him, believing, doubtless, that he is the cleverest man in the world; and on the ground are strewed the spokes, and rims, and odd bits of wheels, reminding one of a puzzle that wanted putting up. We walk away down by the old mill close to the Devon, where the girls working there, in their short gowns and striped petticoats, look as oily and bright as if they were part and parcel of the machinery at which they toil; and then we come upon the little bridge where various lots of villagers are grouped in unconscious picturesque groupings, each and all enjoying the tittle-tattle and the wordy wonders of their little world.

Going to the glen we make our way to the head of the town by a burn that runs from the hills to the Devon; but the water, which leaves the glen clear and bright as crystal, by the time it passes through the mills and reaches the spot at which we stand is not water at all, but has become a composition between blacking and washing blue. Some folks say—"This is the stuff that don't agree with the fish."

We leave the village behind and make for the glen, so as to pick out the points for the best pictures, and also to find out the time at which they would be well lighted. This glen is small and deep-bedded in the hills, but what there is of it is really beautiful. We stood upon a narrow ridge pathway which is made secure by an iron rail, and we gaze away down into the depths below—so deep that it makes your head light and giddy as you gaze.

The trees, towering up the sides and throwing out their foliaged branches to the sun, which, gently swaying with the faintest breeze, made one fancy that they were drinking in the mountain air in pure enjoyment; whilst the feathery ferns, crowding down the slopes in all the abundance and luxuriance of nature's most generous mood, swept down, down to the water's edge, where they were reflected in the singing, glinting, golden stream. And when we reach the waterfall, where it leaps and lashes white in one continual chorus, and throwing up a spray that plays at making little rainbows in the sun, our puny voices get lost in the mighty sound of running waters. So we sit down upon a boulder in the middle of the stream, and in silence enjoy the grandeur of the scene. Mark Oute.

# Meetings of Societies.

## AMATEUR PHOTOGRAPHIC ASSOCIATION.

A Council of this Society was held on Monday, the 12th inst.,—Lord de Ros in the chair.

The minutes of the last meeting having been read and confirmed the following members were elected:—John Adams, jun., Esq., George Whitla, Esq., Miss H. H. Lane, William Armstrong, jun., Esq., F. J. Wills, Esq., William Wilkes Unett, Esq., A. A. Mantell, Esq., William Vanner, Esq., Miss Louisa L. Coxe.

Mr. Glaisher then read his annual report, of which the following is an abstract:—It has been my agreeable task for fourteen years—with, I think, only one exception—to compliment the members of this Association in my annual report on the excellence of their contributions. This year, however, I am sorry to be cempelled to complain that, although one of our members (Mr. J. W. Richardson) has contributed a large number of 16 × 12 pictures equal, if not superior, to anything previously contributed, yet the pictures as a whole are below the average; this is owing to some of our best workers not having been able to send any plates this year. It is, however, gratifying to see the works of many new members, and to note that we have a goodly number of applicants to elect. Mr. Hobson is still as good as ever in his composition, and Captain White has sent a number of cloud studies which, but for some spots and stains, would have been perfect. Captain Smith has contributed a very large number of most interesting Indian views, and Colonel Rocke's pictures are still excellent. The Hon. Noel Waldegrave has sent some small pictures which are exceedingly good.

The following prizes were awarded:—

J. W. Richardson, Esq., for Nos. 6b and 10b, first prize—a silver goblet, value £8 8s. J. W. Richardson, Esq., for Nos. 2b and 5b—an oil painting in frame. Lord de Ros, for No. 1—a silver goblet. Colonel Rocke, for Nos. 37 and 47—a large album elegantly bound in morocco. W. S. Hobson, Esq., for Nos. 116 and 120—a silver goblet. Dr. Brown, for Nos. 16 and 17—a silver goblet. J. C. Stenning, Esq., for Nos. 10, 12, and 13—an oil painting in frame. R. O. Milne, Esq., for Nos. 23 and 29—an oil painting in frame. Colonel J. K. Turnbull, for No. 15—a large album elegantly bound in morocco. Captain G. F. Smith, for Nos. 103 and 125—an oil painting in frame. J. McAndrew, Esq., for No. 38—an album elegantly bound in morocco. R. Murray, Esq., dry-plate prize for No. 93—an oil painting in gilt frame.

Certificates of honourable mention were awarded to G. W. Brewis, Esq., K. D. P. Roberts, Esq., and the Hon. Noel Waldegrave.

The Earl of Rosse proposed a vote of thanks to Mr. Glaisher for the time he had spent in classifying the pictures, and for his able report. This was seconded by Dr. Arthur Farre, and carried unanimously.

A. J. Melhuish, *Hon. Sec.*

# Correspondence.

## SUPPOSED SENSITIVENESS OF FILMS CONTAINING IODIDES OF SILVER.

*To the* Editors.

Gentlemen,—There is a slight mistake in the latter part of the article on me in your last number which I will thank you to correct.

On page 344, second column, line six, you say:—"Owing to the greater rapidity with which the developer acts upon *the iodide*." Instead of "the iodide" it will be more correct to say "*films containing iodide.*"

So far as I could find out, the alkaline developer, as I used it, did not act on iodide of silver at all. The iodide seemed to be dissolved out unaltered by the hypo. diminishing the density of the negative when much iodide was present.

The greater rapidity of development when iodide was mixed with bromide seemed to depend on the greater porosity of films containing some iodide.—I am, yours, &c., C. Russell.

*Stubbers, Romford, July* 19, 1875.

## METHYLAL: THE NEW DEVELOPER.

*To the* Editors.

Gentlemen,—In my article on methylal, published in the last number of The British Journal of Photography, a small error exists in

the formula of the new developer. Instead of protosulphate of iron one ounce, water four ounces, and methylal two ounces, the proportion of water must in reality be *forty* ounces instead of four ounces.—I am, yours, &c., L. Warnerke.

10, *Linden-grove, Peckham Rye, July* 17, 1875.

## LAMBERT'S PATENTS.

*To the* Editors.

Gentlemen,—You will, I have no doubt, be inundated with letters on this subject. I merely write to say that I have for several years used the method described; that is, by straining thin paper over the negative for the purpose of retouching, and, of course, shall still continue to do so. It is quite a mistake to say that no artistic knowledge is required in using this method. How can a novice tell where to place the high lights?

We are all liable to be "taken in" by vendors of so-called "secret processes," as it takes some time to find out what is already known; but when a method is to be patented I should have thought that at least the photographic journals might be consulted by the would-be patentee before he rushes to the patent office.—I am, yours, &c.,

*Manchester, July* 19, 1875. A. Brothers.

*To the* Editors.

Gentlemen,—Very great public interest is felt by photographers in all parts at the present moment by the announcement of the above process. Having made it my business for many years to go in for all improvements, I went to Greenwich to see this demonstration. I have rarely seen so skilled a manipulator as M. Lambert, or one with so keen an artistic eye and hand.

Having seen the operations, occupying several hours, I asked the question—"What do you claim as novel in your patent?" The reply was—"The use of paper on both sides of the negative;" accompanied by the remark that using one thickness only, whether back or front, would not infringe it.

If your readers will look at your issue of December 26, 1873, they will find a paper by Mr. George Croughton, in which, whilst describing his enlarging process, he refers, in words which cannot be misunderstood, to the use of paper on both sides for working up enlarged negatives in pencil, thus effecting certain desirable improvements. In my own practice I have used it ever since, and have shown it to friends, as can readily be proved. I contend, therefore, that this is public property, open for use to all, and that the attempt to obtain a sum of money for its use should be resisted.

The assertion is made that artistic skill is not required in working on the negatives, but this is utterly delusive. It is indispensable that whoever touches on the paper shall have a good artistic knowledge of drawing or retouching, or failure will be inevitable, and the final result depends wholly on skill in this particular. It will be obvious to your readers that such must be the case. The cause of the beautiful results produced by M. Lambert is his own personal skill. An unskilled person would ruin the work at once, however good and sharp the negative might be. I have already borne testimony to the value of the system; this is why I adopted it, and it is beyond doubt that it was invented and described in your Journal on the 26th December, 1873.—I am, yours, &c., Samuel Fry.

*Surbiton, July* 20, 1875.

*To the* Editors.

Gentlemen,—It has been proved that the Lambert patent process was discovered and published by Mr. G. Croughton six months previous to the granting of a patent to M. Lambert. In proof of this I refer to Mr. Croughton's paper read before the South London Photographic Society, December 11th, 1873, which paper contains as much real information on enlargements, and as many useful dodges, as we are informed are communicated to licensees of the Lambert process, but which, curiously enough, were not considered of sufficient importance to include in the patent.

I would, therefore, propose that a substantial testimonial be subscribed by photographers and presented to Mr. Croughton for his discovery and first publication of it. Also, that a meeting be called and photographers invited to subscribe towards forming a fund for the protection of their interests against would-be patentees of previous discoveries.—I am, yours, &c., R. Slingsby.

*Lincoln, July* 20, 1875.

[Of course our correspondent in proposing a testimonial to Mr. Croughton is only indulging in a bit of fun; for no one knows better than Mr. Slingsby that, if testimonials were to be awarded to everyone who has contributed to the advancement of photography, the whole fraternity would soon assume the guise of a mutual presentation society. And included in the formidable list of those entitled to a testimonial would surely be found the name of M. Lambert, for being the *prima mobile* in causing the hitherto-overlooked merits of Mr. Croughton's method of finishing prints to be at length recognised by professional photographers.—Eds.]

## DALLASTINT.

*To the* Editors.

Gentlemen,—I think I can safely say I have solved the problem of how to obtain from photographs from nature or drawings in flat tints blocks printable satisfactorily at the ordinary type press, and without any aid whatever from the engraver except trimming the margin of each block—a purely automatic process.

Just ten years ago I began my experiments for this special object, and obtained at that time some very promising results. I had still some practical difficulties to surmount, and was compelled by other work to keep the process in abeyance. Every now and then—not being able to get it out of my thoughts—I have taken the matter in hand; but it was not till the 14th of this month that I was able to dance and cry "Eureka! Eureka!" Early next month I shall have my specimens out and will submit them to your criticism.

"Dallastint"—as I propose to call the new block process, as well as my old photelectric process, of which it is an offshoot—is a species of aquatint yielding almost microscopic detail and gradations from deep black to the most delicate tint printable. Although letterpress printing can never rival copperplate work—by a suitable modification Dallastint becomes a copperplate process—yet the new block method will come very near to it, while it will, I think, be found much superior to chalk-work in lithography, the grain being finer than the human hand can produce with the crayon on a grained stone. The process has the further advantage of being able to reproduce, either same size or otherwise, not only chalk tints, but mezzotint, ordinary aquatint, and drawings in washes of indian-ink or sepia. It also yields valuable blocks for colour printing.

I should hesitate to make these glowing announcements thus publicly did I not feel now certain from actual results that the process is no longer crude but is *un fait accompli,* and that I have completely mastered the principles on which it is based and the mode of working. In photographic engraving I have never contented myself with results, but have always searched after "the reason why," so as to be able, as Bacon phrases it, "to compel Nature." I hope soon to submit proofs of my success with the good dame.—I am, yours, &c.,

362, *Gray's-inn Road,* Duncan C. Dallas.
*London, W.C., July* 17, 1875.

## PHOTOGRAPHERS' HALF-HOLIDAYS.

*To the* Editors.

Gentlemen,—Will you kindly allow me a corner in your space to state that the photographers of Leeds are very far from being united in the matter of the weekly half-holiday, which it is alleged, in your report of the proceedings of the West Riding of Yorkshire Photographic Society, is likely to become universally adopted in the districts of Bradford, Halifax, and Leeds. To some of us there appears to be strong and reasonable objections against the proposal to close our studios more than one day in seven.—I am, yours, &c., W. Hanson.

*Great George-street, Leeds, July* 20, 1875.

A Proposed Trip.—A photographic trip of a prolonged duration quite undreamt of in this country has been proposed at a meeting of the Pennsylvania Photographic Association. *Here* we think that great things are achieved if one whole day be given up to an "outing;" but at the last meeting of the above-named society Mr. Saylor suggested a photographic excursion to be participated in by the members of the Association as something that he thought would do a great deal of good. He did not mean to go out merely for a day or a few hours, but for several days or a week. He thought that a gathering of this kind would bring the members closer together, and afford them an opportunity of being better acquainted with each other; while by selecting a spot easy of access to most of the members, and within working distance of attractive scenery, photographic operations might be conducted in a satisfactory and pleasant manner. The proposal was well received, and was referred to a committee.

Suppression of Vice.—The annual meeting of the Society for the Suppression of Vice was held on Thursday, the 8th inst., and from the annual report, since published and a copy of which we have received, we ascertain that the success which has attended the Society's operations for the past two or three years has so completely paralysed the trade in obscene books, pictures, photographs, and other articles, that the committee have for the past year little to record in the way of active operations; their vigilance, however, has not been relaxed. From past experience, it has been found that dealers will at once take advantage of any supposed inaction of the Society. A peculiar feature of last year's operations has been the voluntary surrender to the Society by dealers, or by the relatives of deceased dealers, of large stocks of obscene matter. From one of the latter class alone 3,550 obscene photographs, 250 books, and a mass of catalogues and circulars were delivered up to be destroyed; and from a dealer who professed to have given up the trade several thousands were surrendered. The whole have been destroyed. This Society has the warmest sympathies of every right-thinking person.

## EXCHANGE COLUMN.

Handsome show case, made for a front garden, will be exchanged for anything useful.—Address, H. Morris, Photographer, Wandsworth, Surrey.

I will exchange a pair of 5 × 4 doublets, by Ross, for an 8½ × 6½ Dallmeyer's rectilinear or Ross's doublet.—Address, Thos. Smith, Spring Hill, East Cowes, I. W.

A 12 × 15 view lens in perfect condition, gives splendid straight lines, offered in exchange for a Dallmeyer's 1B or Ross's *carte* lens.—Address, P. H. H., chemist, Bollington, near Macclesfield.

I will exchange one of Johnson's patent pantascopic cameras, with clockwork motion, and Grubb's lens complete, cost £10, for anything approaching value.—Address, S., 331, Essex-road, London, N.

A half-plate walnut camera and portrait lens is offered in exchange for a pair of stereoscopic lenses, or a doublet or triplet to cover whole plate.—Address, J. R. Heaton, 37, Lord-street, Barrow-in-Furness.

I will exchange a rapid *carte* lens, four and three-quarter inches focus, by Derogy, or a whole-plate lens nine inches focus, for a set of six medallion lenses.—Address, J. Ireland, photographer, Perth.

A Grubb's B patent view lens, No. 3099, quite new, cost £4, offered in exchange for a view lens by Ross or Dallmeyer for plates 10 × 8. Difference paid in cash.—Address, J. Bulmer, Post-office, Brora, N.B.

I will exchange a maroon velvet curtain, 10 × 5, with tassel, and trimmed in best style, for a quarter-plate or repeating-back camera in good condition. Difference (if any) in cash.—Address, H. D., Bath-street, Wicklow.

A good polished walnut quarter-plate camera and five dark slides in box offered in exchange for a good portable camera-stand, dipping-bath, or anything useful.—Address, J. Chapman, 21, Paddington-street, London, W.

Wanted to exchange, a Ross's 10 × 8 A doublet for a Dallmeyer's rapid rectilinear; also, Elbert Anderson's *The Skylight and Dark Room*, for any other photographic works.—Address, Rev. L. Jones, Brockley, near Bristol.

Wanted, a first-class half-plate bellows camera, portable stand, and ebonite bath, in exchange for a half-plate camera with sliding front for stereoscopic pictures, three dark slides, and quarter-plate lens by Hockin, all fitting into box.—Address, A. Watkins, Bewell-house, Hereford.

Capital Spanish mahogany camera for 8½ × 6½ plates, rising front; one double dark slide for wet and dry plates, fitted with English view lens fifteen inches focus, offered in exchange for group lens by good maker, for cabinets or photographic accessories.—Address, T. Lloyd, Hales-street, Coventry.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

Ross and Pringle. (Edinburgh).—Received. Thanks.

S.—Mr. Brooks's paper will be found in our number for June 18th, of the present year.

Erratum.—In Mr. Werge's letter in our last number, page 348, first column, third line from top, for "stamping in" *read* "stumping in."

Juvenis (Newcastle).—On application to the Secretary of the Royal Cornwall Polytechnic Society, Falmouth, you will receive full particulars.

A. N.—1. We shall probably give a *résumé* of the process at an early date.—2. Messrs. Benerman and Wilson, of Philadephia, are the publishers of the work.

Chemist.—The gentleman named does not contribute to any work of the kind to which you have referred, nor is he aware of the publication of such a work.

S. S. C. (Edinbugh).—*Deutoxide* of hydrogen is only another name for the well-known peroxide of hydrogen. It is sometimes also known by the names "oxygenated water" and "binoxide of hydrogen."

De Courcy.—1. The emulsion may be shaken up a few hours before being used should that appear to be necessary. Filtration is not required before use.—2. It may be filtered any time after being shaken.—3. We believe that M. Lambert does not produce pictures for the trade.

John Gunston.—Your case is one of those upon which we cannot offer any opinion unless we receive a sample of the emulsion to try. It appears at first sight as if you had over-exposed the plates very much. You had better leave at our office as much of the emulsion as will suffice to coat a plate.

J. P.—1. We know of no method of getting the clouds introduced in the enlargement by one operation; but by using an enlarged transparency as an intermediary it becomes very easy to introduce them. If the sky be masked carefully it may, however, be possible to effect a second printing from a cloud negative.—2. From five to eight grains will prove a suitable quantity.

B. (Finchley Road).—Before you can print a photograph upon silk it is necessary that it receive a good sizing of albumen or some similar substance. The following is a good salting mixture:—*Albumen*, one ounce; *water*, five ounces; *chloride of ammonium*, twenty grains. This is poured into a dish and the fabric floated on it for five minutes, after which it is suspended until dry. Sensitise on a fifty- or sixty-grain bath, and tone and fix in the same way as if it were a paper print.

J. Y.—Our correspondent wishes to know how the paraffine is to be added to the collodion in preparing the pellicle films of Mr. Warnerke in the published formula. Mr. Warnerke says—"Add a little paraffine, dissolved in alcohol, to plain collodion." "J. Y." says—"I have tried four samples of paraffine, all of different melting points, both in alcohol and alcohol and ether, but have not succeeded in getting a solution." Perhaps Mr. Warnerke will kindly give the information here requested.

E.C.—Not knowing in what way the paper is prepared we cannot indicate the cause of the bad tones. If you carefully adhere to the directions for toning and fixing issued with the paper you should not experience a failure. The dealer who supplied the paper will, doubtless, aid you in overcoming your difficulties.

Alpha.—When negative varnish acts upon a collodion film and partly dissolves it, it is an indication of one or two things—either that the alcohol, of which the varnish is made is too strong, or that it contains a large proportion of methylic alcohol, which is a solvent of pyroxyline. For this reason methylated spirits of wine ought to be employed with great caution in varnish-making. If the solvent action of the varnish arise from the alcohol being too strong, the addition of a few drops of water will cure it of this tendency.

Traveller.—A *camera lucida* is a prism so constructed that, when it is erected at the distance of a few inches over a sheet of paper spread upon a table, any landscape or scene which is viewed through the prism becomes visible upon the paper in such a manner as to render its being traced by means of a pencil an easy matter. No lenses of any kind are required with it, nor does it need the aid of any dark box or chamber. A *camera lucida* is very useful to travellers who desire to make sketches of any scenes or landscapes which interest them, but who are unable to draw in the usual manner. By this instrument the sketching of a scene is reduced to a mere act of copying on any desired scale.

T. Allen.—The effect of motion in stereoscopic pictures may be imparted by first taking one picture and then, before proceeding to take the other, altering the position of certain parts. For example (and we here use an old illustration), if the subject to be represented be a blacksmith engaged in hammering a piece of iron, one picture must be taken with the hammer raised and the other after it is down on the anvil; and the same applies to other objects having a reciprocatory motion, or of the see-saw character. To allow the effect to be seen in the stereoscope all that is required is to shut off one half of the picture from each eye alternately. This may be effected by various means, the simplest being the sudden oscillatory movement of a plain card in between the eyepiece and the picture.

Received.—G. W. Webster, F.C.S.; D. Winstanley.

Large Camera.—We have just seen at the establishment of Mr. Meagher a camera, completed to order, of large dimensions and very fine workmanship, capable of taking negatives up to forty-eight inches. It possesses numerous appliances for adjustment, and may be extended up to thirteen feet. A sensitising dish which accompanies it measures five feet by three and a-half feet.

## PATENTS APPLIED FOR.

*May* 4, 1875.—"A New or Improved Process for Printing Photochromatic Images."—No. 1663. J. H. Johnson.

*May* 7, 1875.—"An Improved Photographic Changing Box and Dark Slide."—No. 1699. George Hare.

*May* 13, 1875.—"An Improvement in Head-Rests and Stands."—No. 1777. C. Johnson.

*May* 14, 1875.—"A Photographic Apparatus with Portable Camera." (Communicated by J. B. David.)—No. 1791. A. Malfroy.

*May* 17, 1875.—"Improvements in Photographic Printing Frames.'—No. 1825. C. L. Lambert.

*May* 21, 1875.—"Improvements in Apparatus Employed in the Printing of Photographs."—No. 1863. J. L. Sabunjie.

*June* 2, 1875.—"Production of Printing Surfaces."—No. 2011. T. J. West.

## METEOROLOGICAL REPORT,

*For two Weeks ending July* 21, 1875.

Observations taken at 406, Strand, by J. H. Steward, Optician.

These Observations are Taken at 8.30 a.m.

| July. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 8 | 30·02 | NE | 55 | 60 | 64 | 57 | Dull |
| 9 | 29·72 | W | 57 | 59 | 62 | 53 | Dull |
| 10 | 29·60 | NNW | 54 | 59 | 68 | 53 | Cloudy |
| 12 | 29·98 | NW | 51 | 57 | 66 | 51 | Cloudy |
| 13 | 30·23 | NW | 51 | 55 | 70 | 48 | Cloudy |
| 14 | 30·02 | S | 53 | 59 | — | 52 | Dull |
| 15 | 29·65 | SE | 56 | 57 | 62 | 55 | Raining |
| 16 | 29·77 | E | 58 | 59 | 65 | 57 | Dull |
| 17 | 29·85 | NE | 56 | 58 | 56 | 56 | Raining |
| 19 | 29·81 | W | 59 | 68 | 66 | 60 | Raining |
| 20 | 29·95 | W | 59 | 60 | 75 | 59 | Dull |
| 21 | 29·93 | W | 56 | 59 | — | 56 | Dull |

CONTENTS.

THE BRITISH
# JOURNAL OF PHOTOGRAPHY.

No. 795. Vol. XXII.—JULY 30, 1875.

## WET EMULSION PLATES AND IRON DEVELOPMENT.

The introduction, and subsequently the almost universal adoption, of emulsions in photography have, we believe, all but driven the bath out of use in dry-plate work, though as yet it has scarcely affected portraiture. This is to be accounted for by (until recently) the inferiority in point of sensitiveness and the alleged uncertainty inherent in all dry processes. Another possible cause is the necessity of using alkaline development, the conservatism of photographers generally refusing to allow, upon what they consider light grounds, any change from the customs of long ago; hence, we believe, arises the unwillingness of the profession to make any radical change in the everyday work of the studio. But for the benefit of those who are not too deeply imbued with these obstructive ideas we are about to describe a method which is, at least, worthy of serious trial, and which, if found generally successful, would lessen the work of the studio very considerably.

Thus far we have spoken solely of the professional portraitist, who naturally requires the highest qualities as regards sensitiveness, certainty, and quality of result, and who, moreover, in nine cases out of ten, is in the worst possible position for attaining such results, being entirely ignorant of the practical working of dry or emulsion plates. In the case of an amateur it is very different, and to him the method we are about to describe offers special advantages. Who amongst our amateur friends has not experienced the inconvenience of having to keep a silver bath always in stock for the purpose of taking occasional portraits of his friends? and who does not know the unpleasantness caused by the bath being out of order when required for use? This is, unfortunately, nearly always the case with a bath which is only used at irregular intervals; hence the comparatively few amateurs who give any attention to portraiture and the sadly inferior results which are produced.

The method we are about to propose after careful trial places within reach of the amateur a means, always at hand, of producing portraits with the same facility and with a similar exposure as with wet plates, but without the trouble and nuisance of the bath. The manipulations are in no way more difficult, and in spite of our comparatively short experience with these plates the results are but little inferior to those obtained with the best wet plates. The process is based upon the use, as previously recommended by Mr. Stillman and others, of wet emulsion plates treated with an alkaline organifier. Mr. Stillman has stated, at page 621 in our last volume, that the result of a number of trials he made while in America in competition with Mr. Black was in favour of the emulsion plates by two to one; or, in other words, the emulsion plates thus treated were twice as quick as wet plates prepared with the bath. Though we have not attained so high a point of sensitiveness, we believe, under such circumstances, the emulsion plates will be found quite as rapid as bath plates of good quality.

The first consideration is as to which is the best form of emulsion to employ. This, we think, may be answered, without the slightest hesitation, in favour of the bromide or chloriodo-bromide washed emulsion. The old form of emulsion, if containing free bromide, would require prolonged washing previous to organifying, or deficiency in sensitiveness would result, while the same necessity would exist in the case of free silver, in order to prevent discolouration of the film by the action of the alkali upon the silver salt. The choice between the two first-named emulsions must rest with the operator himself; in our experience the one acts equally as well as the other—the bromide, perhaps, giving a little greater sensitiveness, while the chloriodo-bromide gives more brilliancy.

It is unnecessary for us to go into any detail as to the preparation of these emulsions, as the subject has been most fully treated very recently; in addition to which the preparation is now an article of commerce, and may be obtained ready for use.

We will proceed, therefore, to describe the preparation of the plates, which is simplicity itself. The glass is cleaned and coated in the usual manner with emulsion, and is then plunged direct into the preservative bath, where it remains until the greasiness disappears; it is then ready for exposure. The manifest advantage which a plate of this description possesses over an ordinary wet plate in respect of freedom from chance of stains or pinholes justifies us in hoping that, *cæteris paribus*, the emulsion will some day supersede the bath.

The organifier may be made in several different ways, according to the purpose for which the plates are intended. The first and most generally useful for studio work consists of—

Albumen ............... 1 ounce (or 75 grains of dried).
Strong ammonia ......10 minims.
or
Carbonate of soda ...60 grains.
Water ........ .........30 ounces.

This mixture is prepared in the usual manner and carefully filtered. If required solely for portraiture in the studio the liquor ammonia will be found the more convenient form of alkali; but if the plates are to receive prolonged exposures, as for copying or interiors, or have to be carried to a distance, the carbonate of soda should be substituted. In the latter case two ounces or more (according to temperature, &c.) of glycerine will be an improvement in keeping the film moist. The best form of development with this organifier is, undoubtedly, the alkaline.

The next organifier we shall mention is similar to the former, with the exception that no alkali is used. Its formula may stand—

Albumen............................................ 1 ounce.
Glycerine (if necessary) ......................... 2 ounces.
Water ...............................................30 ,,

It is made in the same manner as the previous mixture, and requires a few pieces of camphor to make it keep, filtering it when required for use. This does not give as high a degree of sensitiveness as the alkaline solution, unless employed in connection with one of the older forms of emulsion containing a large excess of silver. It may be used with iron development, and is then a little less sensitive than when the alkali is employed.

In addition to these we have substituted gelatine for the albumen (ninety grains of the former for the above quantity of solution), but have gained nothing by so doing. We have also experimented with nearly the whole of the preservatives in general use, including gum,

gum gallic, tannin and its modifications, coffee, beer, and tea, of course suiting the development to the particular organifier employed in each case. The result has been, however, merely to confirm what we have already said as to the superiority as regards rapidity of the alkaline albumen in combination with alkaline development.

The plates thus prepared will keep for several hours both before and after exposure, and hence it follows that they may, if desired, be used in the field with advantage for instantaneous or very rapid work. An advantage we have not previously mentioned is that they require no backing, the film being dense enough to absorb the whole of the rays falling upon it. For studio work a sufficient number of plates may be coated first thing in the morning to last the greater part of the day; and, if left to soak in a grooved water-tight box containing water, they will be ready for organifying when required; or, if preferred, the plates may be organified and stored away immediately. The latter plan, however, is more troublesome, and great care is necessary to avoid dust.

The development is effected in the same manner as for dry plates, but is more rapid, and the density is more easily obtained. When the plate comes from the slide some time after preparation it will be found to have become surface dry, though still kept moist by the preservative contained in the film. It is necessary, therefore, to place it in a dish of water, or to pour water over the surface; indeed, it is as well to do this even if the plates have not become surface dry, as it renders the development more regular. The film is then treated with a solution of pyrogallic acid, two or three grains to the ounce, without either alkali or bromide. If the exposure be correct the image will come out rapidly, and when the details are visible the plate is again washed to stop the development.

The intensification may be performed by means of pyro. and silver, or by alkaline pyro. well restrained with bromide. The former is the plan we prefer and recommend; not that the latter will not give density enough, but, rather, the contrary. The silver method gives a crispness which is wanting in the case of alkaline intensification, especially when a full exposure has been given. If there be a lack of detail from under-exposure, then the alkaline plan is to be preferred.

The above is the method of development which will be adopted by the majority of amateurs, the greater body of whom have now made themselves fully acquainted with its working; but there are many, we know, who appear to have a wholesome dread of anything connected with alkaline pyro. To such the fact that iron development may be employed with equally good results, though not quite the same amount of rapidity, may prove an encouragement to, at least, try a process which, we are quite certain, would prove of the greatest utility.

A few words of caution are requisite in using the latter developer. In the first place, it should not be used with the alkaline preservative; or, if it be, the plate must be very thoroughly washed before development, and even then the result is far from equal to that obtained with pyrogallic acid. Also, there is greater liability to stains in consequence of the free silver employed, and to abnormal deposits of all descriptions if the development be prolonged.

The developer which has given us the greatest satisfaction consists of—

| | |
|---|---|
| Sulphate of iron and ammonia | 90 grains. |
| Acetic acid | 1 drachm. |
| Formic acid | ½ „ |
| Water | 5 ounces. |

We have also used with good results plain fifteen-grain solution of protosulphate of iron, with fifteen minims of acetic acid, and also the same with five grains of sugar substituted for an equal number of minims of acid. The mode of procedure in each case is similar. After washing the plate flood it with a plain fifteen-grain solution of silver nitrate, which is returned to the same bottle; then flow over the film sufficient of the iron solution to cover it well, and proceed as for a wet plate. If the image appear too quickly, and look flat and without contrast, it is well to have at hand an ordinary solution of acid silver, a little of which may be added.

When fully developed the plate is well washed and intensified in the usual way, the results being scarcely distinguishable from ordinary iron-developed wet negatives. This form of development appears to answer better with a slight trace of iodide on the plate, though the plain bromide films, especially when prepared with excess of silver, are much more rapid, although less easily intensified. We may here remark, incidentally, that iron development is equally suitable for use with dry emulsion plates; but we only recommend it to those who are afraid of alkaline pyro.

In conclusion: even those outdoor workers who still adhere to the wet process in spite of all its inconveniences, because they prefer to see their negatives before leaving the spot, will find their labours and annoyances mitigated by the employment of the process we have here mentioned. In place of the costly and troublesome silver bath—to say nothing of the host of etceteras required to put it into order when it goes amiss—we have a simple solution, which costs next to nothing and may be made *en route*. All uncertainty as to whether the plates will fog today, or be riddled with pinholes, disappear under the knowledge that your emulsion produces plates which are the same today, next week, and next year, and this without any material loss as regards sensitiveness or certainty, or without introducing any fresh intricacies into the manipulations. Whether employed wet in the studio or for outdoor work, or as a "moist" process, we believe the above will be found eminently satisfactory.

## PRINTING PHOTOGRAPHS BY MACHINERY.

Between Caxton's first rude printing-press, by which were produced single copies at slow and laboured intervals, and the triumph of mechanical art by which *The Times* and other daily papers are printed at the rate of many thousands per hour, there exists, indeed, a vast difference. In like manner, between the present slow and tedious method by which photographs are printed by the mechanical, lichtdruck, or collotypic processes at present and the method of even the immediate future there will be, let us hope, an advance equally great. The name of M. Despaquis has for several months past been associated with earnest efforts made, not unsuccessfully, to hasten the advent of the time when the production of photographs at the printing-press may be effected with a degree of celerity rivalling the production of typographic works at the platen printing-machine.

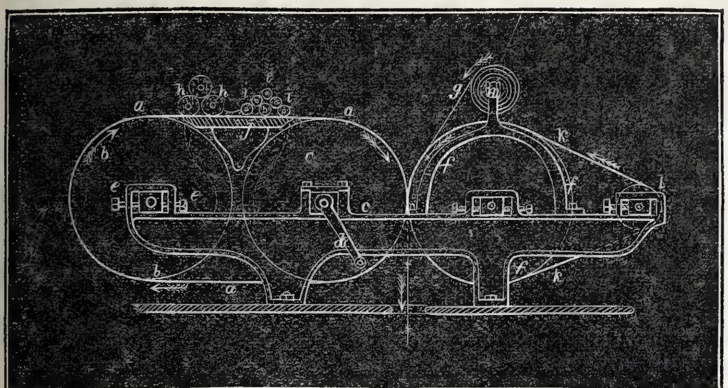
We last week gave an account of the methods adopted by M. Despaquis to indurate his printing films so as to admit of their being used for producing a large number of impressions. We now give, as a fitting corollary to that article, details of the plan adopted by M. Despaquis to print photographs by the introduction of steam as the motive power—a method to which the significant and much-valued term "machine-printing" is capable of being applied.

Like, we believe, all typographic machines in which rapidity is a desideratum, the printing surface in this process is curved; but, unlike the typographic processes, the "surface" in this case is that of a flexible endless band, which passes over two rollers.

Before describing the press and its mode of action we shall explain the construction of the flexible printing-band. A web of flax or hemp (not of cotton or wool) is faced with bichromated gelatine on the surface of which the light has been allowed to act through the negative, and this it is which becomes the printing-band. But a certain method of procedure is requisite in the preparation of this gelatined linen. A single pellicle of gelatine is treated by itself under the negative, and when exposed to light it is sponged on the surface with cold water containing a little glycerine, which retains the surface in a state of moisture, and thus prevents it from becoming insoluble during the operation which follows. This latter consists in laying down the cloth referred to upon the back of the pellicle thus treated, saturating it thoroughly with bichromated albumen, in consequence of which, after it has been exposed to light, no water can penetrate the film, or, at any rate, act upon the linen in such a way as to cause it to swell or become altered. The albumen is applied by means of pouring it over the surface of the linen, by which the albumen, linen, and original pellicle of gelatine which bears the impression on its opposite side, are incorporated and form a strong

flexible web. By exposing the back to the light the entire body of the band is rendered insoluble except on the extreme surface already exposed under the negative, and upon which the light has now no more action, owing to its being still moist with the glycerine.

This forms the flexible printing-surface, and it is impossible not to admire the ingenuity displayed in its production. We now arrive at the press in which this endless printing-band is to be utilised. The following is a drawing of the press in elevation:—



In the above, *b* and *c* represent two rollers or drums, to one of which is attached a handle *d* for the purpose of rotating it. Over these rollers passes a cloth either of ordinary material or of metallic gauze, to which is attached the flexible printing pellicle just described. Three rollers at *h h* serve to moisten the printing surface in the same way as a lithographic printer moistens the surface of his stone by a wet sponge, while a series of other rollers, shown at *i i*, serve to ink the surface wherever the moisture absorbed admits of the ink adhering. At *e* is an adjusting screw by which the large rollers are separated to such an extent as to ensure the printing-band being retained in a tight state.

A third roller, *f*, is placed so as to act against *c*, and produce the pressure of the paper *g* against the printing-cloth. On this roller turns an endless cloth *k*, in flax or zinc, which passes over a second movable roller *l*, which serves to stretch it more or less. Connected with the roller *m* is the paper, in a band, which unrolls by the action of the two large rollers *f* and *c*.

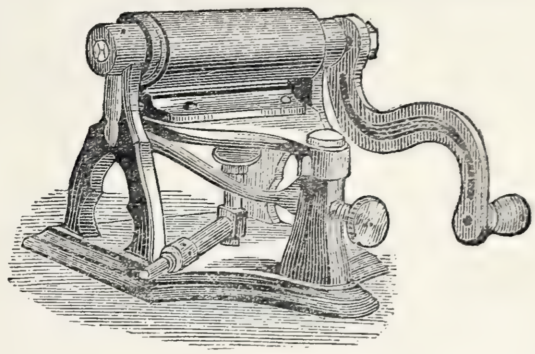
It is, of course, necessary that the ends of the printing-cloth should be united by sewing—not forming a thick seam, but so as to pass smoothly between the two cylinders.

## OSCILLATING BURNISHERS.

That there exists some advantage in *oblique* as contradistinguished from *direct*, and in *oscillating* over *stationary*, burnishers is apparent from the fact that burnishers having these peculiarities are being manufactured and employed.

A few weeks ago, when writing on the subject of machines for burnishing prints, we alluded to the rival claims of two well-known American manufacturers and patentees; and while speaking from experience of one of these productions—that of Weston—we declined saying anything either in praise, dispraise, or even by way of description, of the rival machine—Entrekin's oscillating burnisher—for the simple reason that we had never examined or tried it. Mr. Oborne, of Red Lion-square, the agent in this country for these "enamellers," determined that we should no longer have it in our power to plead ignorance of the special qualities of the Entrekin enameller, has submitted one for critical examination, accompanied by a request that we should speak of its merits or demerits without the slightest reservation. Having by actual practice qualified ourselves for the task, we now proceed to give a brief account of the Entrekin burnisher.

Like that of Weston, the planishing of the photograph by the Entrekin enameller is caused by the picture being forced over a heated and highly-polished steel burnisher. As will be seen from the annexed diagram, Entrekin's machine presents an elegant appearance. The feeding roller, which is rotated by means of the handle, is slightly roughened so as to bite the back of the photograph, which, by the rotation of the handle, is dragged over the face of the hot burnisher beneath, under a high degree of pressure. The result of this action is that the print emerges from its contact with the polished burnisher having an exceedingly fine and glossy surface, of quite a different and much superior character to that



imparted when passed through an ordinary rolling-press. A Bunsen or atmospheric gas burner, removable at pleasure, is fixed to the base of the machine, as seen in the diagram; and when, by means of a flexible tube, gas is laid on and ignited, the requisite degree of heat is speedily obtained. In *ateliers* where there is no gas the atmospheric burner is superseded by a spirit lamp.

The method of applying the requisite pressure to the picture is very ingenious. A milled-headed screw, which is seen projecting from the vertical pillar on the right hand side, acts directly upon inclined planes or wedges of steel at each end of the burnisher, and upon which it rests; and by the screwing or unscrewing of the milled head these metallic wedges cause the burnisher to approach to or recede from the roller, thus affording ample adjustment for pictures mounted upon every variety or thickness of card.

By means of a simple mechanical contrivance—namely, a stout pin acting in an eccentric groove at one end of the roller—an oscillating motion is imparted to the burnisher. This seems to have been found in practice to secure a very high polish on the picture, while also ensuring immunity from scratches. We were, at first, much puzzled to understand why the oscillatory motion should possess any superiority over the direct action of a rigid burnisher; but, after carefully noting the vibratory action of the polished steel upon the prints, we find that the advantage is by no means illusory. This, indeed, was proved in practice; for having had occasion to burnish, by the agency of this machine, three dozen stereoscopic views we inadvertently dispensed, in the case of two-thirds of this number, with the preparatory application of a weak alcoholic solution of soap, which is highly recommended in order to ensure freedom from markings or scratches, and yet we quite failed to discover any detriment or damage arising from the omission in the case of any one of the prints.

We here take occasion to remark that stereoscopic pictures gain to an inconceivable extent by being burnished. The finest albumenised paper obtainable is frequently unsuitable for showing in the stereoscope a delicate subject in all its pictorial grace; the granularity of the surface, especially if the light fall obliquely on the picture, shows unpleasantly. But when all minute granulations and roughnesses in the albumenised print are destroyed, and a perfect polish imparted to its surface, then is a picture upon paper in a favourable condition to compete in respect of beauty with a transparency upon glass. So thoroughly are we convinced of the exquisite finish imparted to stereographs by submitting them to the action of the burnisher, that we have determined that all the finest pictures of that class in our collection shall undergo this treatment.

It may be expected that we should say something regarding the patent rights in the two American burnishers; but we do not conceive that there is any necessity for us entering upon that matter. We have given our opinion of the merits of each instrument, and prefer to refrain from making any observations with regard to the respective patents beyond acknowledging the receipt of a pamphlet in which we are informed that, so long since as February 24, 1863, W. E. Lockwood obtained a patent for a burnisher for planishing paper by

submitting it to "friction under pressure between a roughened feed-roller and a planisher." We are not aware of the state of the law in America; but we hold the opinion rather strongly that, according to English patent law, Lockwood's patent of 1863 will be accepted as publication, and must, in this country at least, influence all subsequent patent claims resting upon what may have been embodied in his specification, and this whether or not any patent was taken out by him in this country, and, further, whether his patent be valid or invalid, be good or bad, be still in force or may have long since lapsed.

As noticed in our *Foreign Notes and News* of last week M. Plucker an artillery officer, and a prominent member of the Belgian Photographic Association, has revived the old idea of development by means of ammonia vapour. It is needless here to trace the course of alkaline development through all its changes up to the present day; suffice it to say that it was in the form of vapour that ammonia was first used, but that up to the present time no practical application of the vapour method has been found. M. Plucker's plan, however, appears to be quite feasible, and we can vouch, from practical experience, as to the success of the development, the only remaining question being the keeping qualities of the semi-developed image. Upon the latter point depends whether the vapour method is likely to be of real utility or only a fanciful variation from the usual process. If, as is claimed by M. Plucker, the half-developed plates may be kept *for years* before intensification without danger of stains, spots, or deterioration of the image, it follows as a matter of necessity that a very great power is added to those already possessed by the dry-plate worker. It is more especially to travellers that the vapour method offers the greatest assistance in performing the double purpose of assuring the success of each individual plate previous to leaving the neighbourhood, and, at the same time, securing it against any chance of fading away under the lapse of time. It would, moreover, be a matter of much greater ease to develope in one operation the whole of the plates exposed during the day than to develope a single one by the present method, provided, of course, suitable apparatus were at hand. One point, however, we must remark upon, viz., the plates which are used by M. Plucker are *bath* plates and the preservative contains tannin. It is well known that plates prepared in that manner will give an image under treatment with either alkali or pyro. alone, but that some emulsion plates will not. It will, however, be a matter of ease in such instances to use a preservative containing pyrogallic acid, or, in the case of a washed emulsion, to introduce a small quantity of pyro. into the emulsion itself. Though scarcely yet to be called practicable we hope to see this method worked into a position of undoubted utility.

## THE PHOTO-RELIEVO PROCESS.

No. III.

### The Production of Intaglio Moulds.

Three distinct methods of effecting this may be employed, viz., electro-deposition, pressure, and casting. The first of these methods, however, is attended by so many inconveniences that it has been abandoned, and I think is not worth describing or reviving. The second is by far the most desirable of the three, and may be accomplished by means of a hydraulic-press, a screw-press, or a rolling-press. Of the third I have personally had no successful experience.

A number of metal plates are prepared, the composition being lead, with a sufficient admixture of type metal to confer a slight degree of brittleness. The metal is rolled into sheets with a polished surface, and about a quarter of an inch in thickness. These sheets are then cut up to the desired size. It is better to effect the pressure on a day when the atmosphere is dry, as otherwise, by hygroscopic absorption, the gelatine swells slightly, and loses sharpness under pressure. The metal is now put on one of two suitably-sized and perfectly-true steel plates (surface plates) of considerable thickness for *carte* size—about an inch, the relief upon the metal face downwards, and the other surface plate upon the talc or glass side of the relief. The pressure is then applied either in the screw-press or the hydraulic. An excess of pressure must be avoided, otherwise the metal will be "dragged" and the intaglio spoilt.

In the earlier days of this valuable process a singular difficulty was encountered when the attempt was made to impress large plates ($10 \times 8$). It was found that under a certain pressure the margin of the picture was excellently brought out whilst its centre had not yet appeared. An increase of pressure sufficient to bring out the detail of the centre so "dragged" the margin as to ruin the result—a circumstance which led Mr. Woodbury to infer that the production of these sizes was impracticable, to which effect he expressed himself in the journals of the time. As was afterwards found, however, it was simply a question of the thickness of the plate. Given a size which could be impressed to satisfaction, if one of four times the area were required four times the thickness of metal must be used.

At first sight it may seem impossible to subject a sheet of glass to enormous pressure without fracture. This, however, is not the case if care be taken to use a plate of metal exactly the same size. A small hydraulic press suitable for plates $5 \times 4$ can be obtained for £25 or £30, whilst one suited for pictures $12 \times 10$ costs from £40 to £60. The amount of pressure needed varies with the density of the metal and the thickness of the plate, but averages about fifty or sixty tons per five by four-inch plate, or from two and a-half to three tons per square inch.

I have never *known* a screw-press to be employed for making intaglio moulds, but a simple calculation makes it manifest that the pressure in question can be obtained thereby. Suppose, for instance, we want an aggregate pressure of sixty tons, and our arm exerts only a pressure of one hundred pounds, it simply comes to this—that we want our power multiplying by thirteen hundred and forty-four, for which purpose we require a press in which the thrust moves the one-thirteen hundred and forty-fourth part as far as the handle to which our power is applied. Suppose the thrust to sink an inch per revolution, and to be surmounted by a wheel containing sixty cogs, which is geared into another containing six, which is again surmounted by the arm to which our power must be applied; ten turns of the arm produce a downward movement of an inch, so that an arm two feet in length will give us all the power we need.

Such a press would manifestly have to be made specially for the purpose, and be of enormous strength. A common dentist's rolling-press, in which the pressed surface has length with very little width, has, however, been found in practice to answer very well. Indeed the best relief prints I have ever seen are from an intaglio made in such a press. The moulds when once obtained must be handled with great care, as they are easily injured so as to yield inferior prints.

In casting I made some few experiments with fusible metal on the wet relief with the object of producing a very deep intaglio, but with no results of value. I find, however, from my note-book that Mr. Woodbury had resorted to the use of sulphur for this purpose. His recommendation is that the gelatine relief should be carefully greased by rubbing with a soft piece of wash-leather previously dipped in a few drops of oil. Melted sulphur is then poured into a suitable mould and the greased relief laid on it. When cold the two are separated, and the sulphur intaglio is ready for the printing.

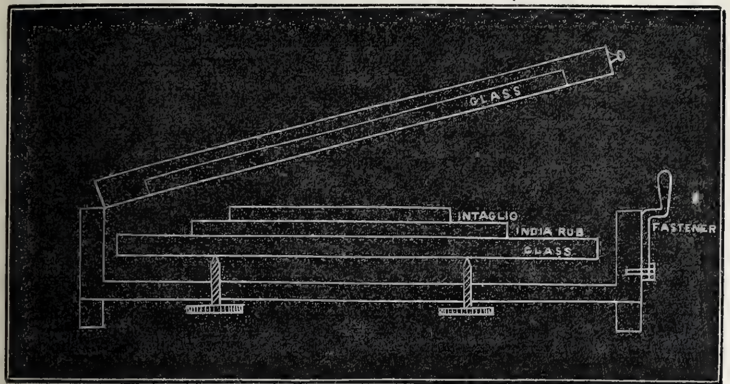
### The Preparation of the Gelatinous Ink.

No definite formula can be given for the preparation of the ink, as the same effect may be obtained with different proportions of gelatine by raising or lowering the temperature and by increasing or diminishing the pressure. The colour depends upon taste, and its depth upon that of the intaglio to be employed. A quantity of the solid hydrated gelatine is melted in a pot placed in a pan of boiling water. It is then diluted with about its own volume of water and mixed intimately with the colours, viz., the water-colour lamp-black and crimson lake sold for the use of artists in small tin tubes. When it has been ascertained by experiment that a sufficient quantity of these colours has been added the whole of the ink is carefully strained through muslin, and is ready to be used. It is kept in a fluid state upon a water bath furnished with a thermometer and the means of adjusting the temperature.

### The Operation of Printing.

For this purpose a press of peculiar construction is required. A piece of thick plate glass is placed on the extremities of screws pointed upwards through the bottom of a suitably-constructed box. A piece of thick vulcanised india-rubber is laid upon this plate, and the metal intaglio upon the india-rubber. The lid of the box, which is furnished on its inner surface with a piece of thick plate glass,

is arranged to turn down on hinges and bolt in its position tightly over the relief, as shown in the accompanying diagram.




When the printing is about to be commenced the lid is closed, and the relief made to press gently against the upper glass by adjusting the screws beneath. It is absolutely necessary that the paper used should be of proper quality, otherwise the results are worthless. The qualities most needed are uniformity, non-porosity, and a glassy surface. The ink, having been heated to the proper temperature (about 90° F.), is stirred round with a brush, and a pool of it poured on the intaglio—not in the centre, but nearer the end next to the hinged side of the press. The paper is now laid down upon the ink, and, in order to prevent bubbles, is bent in a curve. The cover of the press is bolted down, from thirty seconds to about a minute allowed to elapse for the setting of the ink, and then the lid is raised, and the printed picture pulled up by one corner.

D. Winstanley.

## FOREIGN NOTES AND NEWS.

Photo.-Engraving on Glass and Aubeldruck.—Actinometers.—The New Velocipede Tent.—New Publications in Connection with Photography.—A Simplification of the Carbon Process.—The Chloride of Copper Intensifier.

That glass can be engraved as well as steel or copper is no new discovery. Years ago the application of various mechanical modes of transferring pictures to glass restored glass engraving to its former rank as an art-industry, from which it had sunk to the level of a mere recreation for art-amateurs. Glass is etched in the same way as metal, only that, instead of nitric acid, fluoric acid is used for etching blank outlines, and fluoric ammonia for graining. Both white and coloured glass can be etched. On white glass a dead design without a background is etched with a solution of fluoric ammonia. On flashed glass the acid is allowed to eat completely through the thin coloured upper surface, so that the ornament is sunk, clear, colourless, and transparent, surrounded by a coloured background. By the lithographic mode of printing upon glass the most elaborate design can be so cleanly and boldly printed upon the protected coloured surface of the flashed glass as to leave it ready for the acid bath. By printing the design on the asphalte or other background the old laborious drawing of the design by hand and grinding and graving is entirely done away with, and the most delicate samples of net or tulle can be reproduced upon the background. These engravings usually ornament *objets de luxe*, such as drinking vessels, window panes, and so on.

From time to time attempts have been made to apply glass engraving to the production of heliographic plates by combining etching on glass with photography. In this country M. Joubert patented such a process some ten years ago, and on the continent M. Scamoni, of St. Petersburgh, amongst others, published a process for converting a collodion negative on glass into a glass engraving to be printed from directly; but, as yet, none of the adaptations of glass engraving to heliography have been successful. This failure is possibly due, in part, to the fragility of the glass, which renders the plate extremely liable to break in the printing-press. Herr Leipold, of Lisbon, who has been writing a great deal lately on this subject, thinks that this drawback may be overcome by means of M. de la Bastie's invention, if, indeed, it be not already surmounted in the *Aubeldruck* process which he supposes to be a successful combination of photography and glass engraving. Whether Herr Leipold be right or wrong in his surmise we cannot pretend to say, as Herr Aubel has not yet published his *modus operandi;* but from the account of the new heliographic process in the Hamburg *Lithographia*, we have gleaned the following details:—

Aubeldruck has nothing in common with photolithography. A photographic negative is directly changed into an engraved, printable plate as hard as steel without the intervention of gelatine, asphalte, or any other organic substance. The process is simple, while good plates are the rule and failures the exception. The lines of the original plate are reproduced exactly, and are as perfect when the plate is reduced as when it is of the same size as the original. The time occupied by taking the original and transferring it to stone varies from half-an-hour to two hours, and then the stone may be washed with oil of turpentine without injury to the drawing, still giving as good impressions after the washing as before. It is printed with lithographic ink, and is much more easily managed than the ordinary lithographic stone, printing without blot or difficulty the closest and finest hatching. And last, though by no means least, there is practically no limit to the number of impressions that can be printed, and the cost of producing impressions by Aubeldruck is such as to place this process in a favourable position to compete with woodcutting as a means of illustrating books and periodicals. Though Herr Aubel has not yet published a full account of hi invention, he invites anyone who wishes a more convincing proof of its practicability than is afforded by the specimens of the work produced to call on him at Cologne and see the process.

At a subsequent meeting of the Berlin Society, Dr. Schimann compared the respective merits of Boivin's and Batho's actinometers, and came to the conclusion that the want of an equal scale is a great drawback to their usefulness, as only a practised eye can judge of the depth of the printing. He then went on to say that this deficiency is done away with in Vogel's actinometer, where the degree of printing can be read off at once; but, then, it is not nearly so exact as Bunsen's or Roscoe's pendulum photometer, though with a few modifications it might attain a greater degree of precision than it has at present. As a provisional actinometer, accompanied with a scale for testing the comparative sensitiveness of paper, for instance, he proposes the following arrangement:—Fasten a slip of rough paper sensitised with bichromate of potash to a board, and place alongside of it a scale marked at equal intervals like that of Vogel's photometer. Protect the sensitised paper from the light by another board, which should be moved down the paper an equal distance for every interval of an hour, or, if a more subdivided scale be required, at intervals of ten minutes. He (Dr. Schimann) then produced a table showing the variation of the light on the day of the meeting. On that particular day the light remained of about the same intensity from eleven o'clock till twelve; from twelve to two it failed rapidly, and sank a little lower still between two and three; from three to four it remained almost stationary; and at four it was about as strong as by eleven.

The new tent upon velocipede wheels was the next subject discussed. It was pronounced of a very light construction and suitable for amateurs, but difficulty had been found in getting it over moors or off the high road. This is exactly what we said would be the difficulty when the subject was first mooted some months ago.

Two new books in connection with photography have been recently published in Paris. The first, by M. Geymet, is entitled *Eléménts Complets de Photographie.* It is said to be replete with experiments and advice of a thoroughly practical nature, theory being treated but to a limited extent. The other is the first volume of a work of some size, by Padre Secchi, on the *Sun*. This work treats more especially upon the theoretical explanations of the scientific difficulties connected with our present knowledge of solar matters, and photography, as might have been expected, comes in for a fair share of consideration. The work is published by M. Gauthier Villars. The second volume will be ready by the end of the current year.

M. Ernest Boivin (a gentleman alluded to in a previous paragraph), in concluding a series of papers on *Photographing in Carbon*, mentions a method which will be of use—to amateurs especially—for obtaining a non-reversed print with only one transfer, that to the final support, and which may be developed and completed at one operation. After exposure pin the tissue by the corners to a board, and coat with thick transfer collodion; when dry cut round the edges to facilitate the separation of the picture, and plunge it into warm water. As the development proceeds the collodion film becomes separated from the paper support carrying with it the picture, which is then placed upon its final support by dexterously slipping a piece of the usual gelatinised paper under it as it floats. The picture, when dry, has a brilliant, glazed appearance; but, if

a matt effect be desired, the collodion may be dissolved from the surface by means of ether and alcohol, and the picture then treated with a solution of alum or gallic acid to fix the image. In order to secure delicate half-tones it is a good plan to coat first with a very thin collodion, and, when dry, to repeat the operation with the thick transfer collodion.

At the last meeting of the Photographic Society of France M. Perrot de Chaumeux, in his review of the journals, brought under the notice of the members the method of intensification with chloride of copper which we introduced a few weeks ago. In the discussion that followed M. E. Audra stated that he had been experimenting a good deal with emulsions, and had found great difficulty in obtaining density; but, having tried chloride of copper, as recommended in The British Journal of Photography, the results had been all he could desire.

## ON THE USE OF PHOTOGRAPHIC AND CHEMICAL APPARATUS.

### CHAP. XII.—CUTTING, DRILLING, AND WORKING GLASS.

[Conclusion.]

Drawing Out Tubes.—This is required for making pipettes, tube funnels, syringes, &c. If a tube be evenly heated in the flame till soft, then *withdrawn* quickly and pulled asunder by its ends, it will contract to a capillary bore, and finally separate into two pieces, each possessing a closed, pointed end. When a pipette is required to be made the drawing apart should be stopped before the contraction becomes capillary—when, in fact, the thickness is about what will be required in the finished article. The tube may then be divided in the middle of the contraction, and the fine end thus produced held in the flame for a second or two till the rough edges of the fracture become smooth and even.

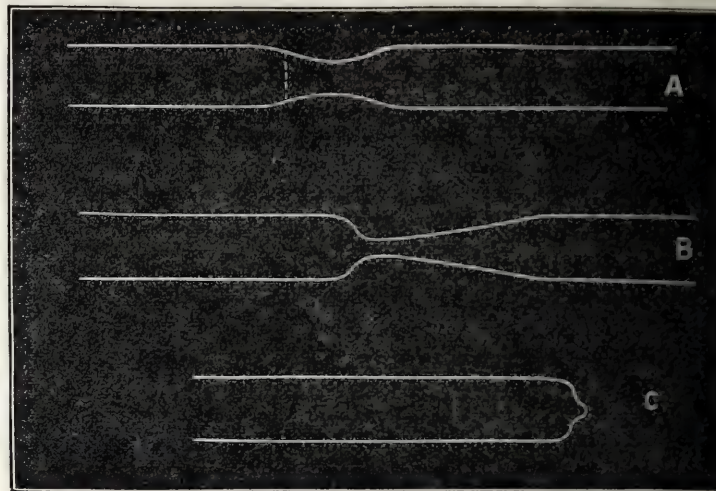
If the heat be applied to a small length of the tube the point will be short or obtuse; if a broader space be heated it will taper gradually to a point. If a considerably-extended point be required it will be found best not to continue the heating and drawing at one operation; but when a certain length has been extended, as described, to start a fresh extension a little nearer the wider part of the tube, and so on till the required length is obtained. The drawn-out part will then consist of a narrow tube with a series of little beads, as it were, of a slightly wider diameter; these may then, one by one, be heated and drawn out till the whole of the narrowed tube is of a uniform bore.

In many operations with tubes, especially if thin, their thickness is liable to become attenuated to such an extent that the required article, if properly formed in other respects, becomes so fragile as to be of little use. To prevent this effect the tube, whenever necessary, should be *thickened*. This is done by holding it in the flame (allowing as great a length as is considered desirable to be acted upon) till it is quite soft. It will then, as it continues to be held in the flame, gradually contract and thicken up. This will be an excellent test of the student's skill. If he be unskilful the tube will twist and warp and be useless for any purpose; but, if he have attained the necessary address in handling the soft glass, he will be able to keep it quite straight, and, moreover, increase the effect by the gentlest possible pressure upon the thickened part, or to apply the heat while the tube points slightly upwards, when its own weight will answer the same end.

These instructions presuppose the glass tube to be of length enough to be divided some distance from the end. When, however, it will not allow of being much diminished in length the fingers must be saved from burning by attaching another small piece to the end that is to be pointed, which is done readily by holding the two ends to be joined in the flame till hot and then pressing them together.

*Closing Tubes.*—This operation is of constant occurrence in forming test tubes, closing tubes to hold specimens, and for very many other purposes. It will be the easiest, in his first essays, for the student to take a piece of tube of the desired thickness, and long enough to make two test tubes, though, when but very little dexterity is attained, it will be quite as easy to use a short tube, and work it in the manner to be now described for a long piece, joining another piece to it by heating the two in the flame. The mode of procedure consists, in effect, in heating the tube till soft, and, with proper precautions, drawing it asunder while soft.

First, as to the heating. This must be done in just the opposite manner to that required for bending tubes. The heat must be concentrated as much as possible to one narrow space instead of spreading it, and must be rather intense. As soon as the glass—which should be rotated all the time—is quite soft it should be steadily drawn asunder, when, as it elongates, it will contract in diameter and assume the shape A in the diagram. The heat is now




to be carefully regulated, as the tube being thinner a less powerful flame is needed. It should be directed a little above the thinnest part of the tube, yet not too near the unaltered part; the dotted line in the diagram shows the place where the flame should play. Drawing the tube a little more asunder, and keeping the flame in the same relative position, it will contract to a capillary bore like B, and then a strong blast of flame at the narrowed part will fuse it entirely. Upon separating the two pieces into which the tube is now divided, the one upon which the attention has been concentrated, *i.e.*, the left-hand piece, will be left with a small lump or button of glass as represented in C.

It is to be understood that, all the time, the right-hand portion of the tube plays the part of a handle or help in making a properly-finished work of the other side; it is useless trying to make two good tubes at one operation. If this adherent knob of glass be too large and clumsy it must be partially got rid of by attaching to it a waste piece of glass (which is readily done by heating it in the flame and pressing it to), and then, after directing the heat just above the knob for a moment, drawing knob and all away. In any case a small lump is left and must be got rid of. The flame is to be directed to it, and on to the whole of the bottom, until it is quite soft; the lump being thicker, and parting with heat less readily, will become hotter and softer than the rest, and will have a tendency to spread, which will be increased and rendered uniform by putting the open end of the tube between the lips and very gently forcing in the air, carefully graduating the strength of the pressure to the thickness and heat of the glass. With a little practice the lump will be made to disappear and an uniform and even roundness given to the bottom. The first failures will probably be in the direction of making the bottom almost pointed instead of round, and in being unable to get rid of the knob of glass. Practice will soon overcome this difficulty. A badly-made tube should be re-melted and shaped, by attaching a piece of waste glass as described and performing the whole operation again, rather than that an imperfect piece of work should be allowed to suffice.

When the tube is thus made perfect at the closed end its mouth should be finished off by softening it for a short distance; this will fuse and round off the sharp edges, and the test tube will be still further improved by giving a slight flange to it while still hot by slightly pressing into it the iron cone or a piece of charcoal cut or rasped to a suitable shape, and moving it to and fro till the requisite form is given.

The piece of tube left after producing the first test tube may next be taken in hand, and formed into a second by strongly heating the tail of glass that would be formed in it at the separation, and then drawing it off as a semi-fused lump, after which the remainder of the working is as just described.

With thin glass special care has to be taken to heat a more extended portion of its surface, and not to draw it out too quickly or it will run into holes. It is advisable also to thicken the tube at the place in the manner explained, pressing it lightly against a cold, flat piece of metal to increase the thickening, and if, when closing the end, it be found that it is still too thin, the drawing out must be stopped, and the thin part again held in the flame and allowed to thicken.

*Blowing Bulbs.*—Dexterity in making bulbs will be found useful in making pipettes, tube funnels, &c., and is more difficult to acquire than any of the operations yet mentioned, requiring very consi-

derable practice before a moderate amount of success is obtained. The operator may experiment in the simplest way by forming one at the end of a tube. First closing the end, it must be thickened very considerably in the flame, aiding the effect by judiciously pressing it against a flat piece of metal, which must be quite cold; this must all be done with care, so as to keep the part as even as possible. When sufficient substance has been given to the part it must be very strongly heated, quickly withdrawn, and then blown into. This is the critical part; for, if the pressure of the breath should be at all too strong, a large bulb of extraordinary thinness will instantly be produced, which is not of the slightest use. Keeping the eye fixed on the expanding glass the pressure should be regulated according to the way it is seen to progress, and if the requisite size cannot be obtained at once the half-formed bulb must be placed in the flame again and the operation finished.

When the bulb is required in the middle of a tube the operation is mainly the same. The glass at the required part is to be thickened, and then, when made sufficiently hot, expanded by the breath with the precautions before given, taking care never to commence blowing until it is removed from the flame.

When a sufficient body of glass to form a bulb cannot be obtained owing to the thinness of the tube a short piece of tube of larger diameter may be attached to it. The succeeding paragraph will give sufficient detail.

*Joining Tubes.*—If tubes to be joined are of unequal bore they should first be made equal by drawing out the wider one till it is of the same thickness as the other. One end of each must then be brought to a suitable condition by closing it, heating it well, and then blowing into it very strongly; a very thin bubble, as before described, will be formed. This can then be broken away, and the ends of the tube, which will be left slightly expanded, may be placed at the same time in the flame, and, when in a half-fused state, pressed together. They will then form a perfect though unsightly join, which can be made quite seemly by working in the flame awhile, drawing out or, sometimes, thickening up, and, if necessary, expanding a little by the breath till all inequalities are removed.

This method, with slight variations, will be found of great use for joining one tube into the middle of another, as, for instance, in making a syphon with a suction tube. The end of the tube to be attached is widened as just described, and a similar raised surface formed in the wide tube, by directing a thin-pointed flame so as to heat strongly the spot where the tube is to be inserted, and then blowing strongly in, stopping up the end either by placing the finger to it or inserting a cork. One of the thin bubbles of course forms, and, when it is broken down, the surface left is just suitable for forming the junction. More care and skill is needed than in the first case, there being some difficulty in preventing the heat spreading too much, and so bending and malforming the pierced tube.

A small, tube-shaped orifice may be made into any small vessel by heating the glass strongly at the required spot with a fine Herepath or blowpipe flame, and then, by means of a piece of heated glass rod made to adhere by slight pressure, drawing it out the moment the place is sufficiently softened. When dexterity in joining tubes is attained the student will possess additional means of making bulbs, &c. A short, wide piece of tube attached to a narrower one enables a bulb to be more readily formed when it is required to be of some size.

*Tube Funnels.*—These are easily made in the manner alluded to in the last paragraph, by joining a wide to a narrow tube and giving a pointed termination to the opposite end in the manner explained. If, however, the tube be of sufficient substance, the end can be opened out by the iron cone, and sufficient width given to answer all purposes. The "thistle-shaped" funnel may be produced by first blowing a bulb at the end of a tube, and then opening it out by heating it at the point furthest from the tube and blowing a thin bubble, which, when broken down, leaves an orifice that can readily be shaped with charcoal or the cone.

All these operations need care and patience to execute them perfectly, though to see them performed by an expert it would be thought that nothing could be easier; but this is little to be wondered at, for experience shows that the same thing may be said of almost every operation the chemist or photographer has to perform. Patience and perseverance will overcome all obstacles, and, though I hope the reading of these chapters may have been of use to some, I can only conclude them by saying that manipulative skill can least of anything be obtained by reading. Books may be of great help, but practice is required to make them of any real use, and my opening exhortation to *Cleanliness* I will now make *Practice and Cleanliness.*

G. Watmough Webster, F.C.S.

## OUR CLUB.

### No. VIII.—We Engage an Assistant and Meet a Rival in Art.

On returning to the hotel we found a goodly company assembled in the smoking-room. In our ardent study of nature we lit our cigars and joined them. A youth of about eighteen years of age seated at the table attracted our attention immediately we entered. He bore the stamp of a stranger—a smart lad, with a free, open face, a merry, twinkling eye, while on his upper lip was sprouting the veriest baby of a moustache about six months' old. He was fair, soft, and downy. Our entrance had evidently stopped him in the midst of the "story of his wrongs;" for, after we were comfortably seated, the red-faced man in the corner exclaimed—"Now, youngster! go on with your story, for I like pluck!"

The lad seemed to have plenty of that commodity, so, as desired, he went on. The tale can be told in a few words. The boy's father had ill-used him, or, rather, he thought so—being rigorous, exacting, and all that sort of thing, you know. Like a thousand other boys under similar circumstances he resolved to run away, but, unlike nine hundred and ninety-nine out of a thousand, he really did it.

I tried to induce the wayward youth to return to his home again, but he asserted that he had "a soul above slavery," and that he would work for himself. Tom was of opinion that he was a likely lad for an assistant, and so thought I; but there was an obstacle in the way in the shape of a tall, thin, twisted-visaged individual, with a "stitch" in his eye, who was seated at the head of the table, busily playing "guardian" to the boy. He took him under his wing and kept counselling him as to his future walk in life, which was in *his* company, of course.

This gentleman was the proprietor of a diorama which had been "pounded" for debt, and he was just waiting on "that little remittance" which was daily and hourly expected. What a weary time these remittances take, as a rule! And, do you know, the post-office people sometimes never bring them at all! In such cases it's wonderful how hopefully and joyfully the expectant waits, until one fine morning he disappears. He must be coming back, for he has left his bag, and it is so heavy; but, alas! when it is opened it is filled with bricks, and as the building material is no use to the landlord he is swindled. So the painted canvas is left to lie and rot. "Another version of the same," I thought, as I listened to his oily tongue.

The boy, who was the hero for the hour, sang two or three songs, and he had really a fine voice.

"I could make your fortune for you in a few years with that voice," exclaimed the fatherly party. "You join me and I will put you in the way of making money."

"You don't seem to have done much in that way for yourself, governor," said the landlord, in a tone of half fun and whole earnest; he evidently had some doubts of his bill.

"Never you fear. You are all right," the thin one replied, with a knowing wink. "I expect that letter tomorrow."

"There seems to be a good deal of Shakespeare about you," replied the landlord, with a sneer. 'Tomorrow, and tomorrow, and tomorrow!' there don't seem to be any todays in your diary."

"Come, sing us another song, lad, and thus still the angry growlings of mine host." Then, turning to the landlord with a smile and a bow, he continued—"I really can't afford to quarrel with you just now."

We had another song from the youth—something about setting sail upon life's ocean and defying the tempests and never despairing. He really looked as if he meant it, and it was voted a very appropriate song, and well sung.

When the bar was closed, and we were about to retire to rest, I asked the landlord to let the boy have a bedroom and I would see it paid, as the lad was possessed of little or no money.

I got hold of Joseph—which was the boy's name—early next morning, and in conversation found that our twisted-visaged friend had made a considerable impression upon the boy with the glowing accounts he had given him of a stroller's life, so, as I thought that he would make a good hand for us, and believing that our profession was certainly better for him than the singing business, I set myself to take the wind out of the thin one's sails. At last the boy was willing to join us; but I would not have him unless he allowed me to write to his father to explain matters, and, if possible, to get his sanction to let the boy remain with us.

I received a reply. The old gentlemen was evidently of a very fiery temperament, and had not got cooled down after his son daring to leave his house; so he wrote "that as the boy had made his own bed, so could he lie on it." The boy was willing—thus did the matter lie—so we engaged him. As we intended to take a run for a day or two round and about the vicinity, to see exactly what was worth doing before starting, we thought of taking Joseph to a small photographer that we had heard of in the village since we came, so that he might give him a few lessons for a few shillings if he were willing, and the three of us made our way to the village photographer's place.

We found it. It was in a cabbage garden run wild with weeds. The door was locked, and we were looking about for some one to ask where the proprietor might be, when a little girl appeared, who seemed astonished at the unusual arrival of three visitors, but was equal to the

occasion. She ran to fetch her father, who came with the key of the studio in his hand. He unlocked the door, which was with much difficulty pushed back, and we were invited to enter. The place would be about sixteen feet long and about six feet wide—about eight feet glass and the other eight feet wood, damp and streaky. It had a ridge roof, and the floor was just the damp, brown earth, with a little wooden platform at the lightest end for the sitter. There was no dark room, but only a box fitted with sleeves and a little glass window in the top. This box stood on an exaggerated camp-stool. A quarter-plate camera and lens and a tripod stand completed the list of the working plant.

"I looked far back into other years," I said, turning to Tom.

"Exactly my sentiments," he replied.

After we were safely in, in answer to an inquiry as to what we wished—

"I want this boy's portrait taken," I replied, with a smile.

"And I won't take that boy's portrait," the photographer exclaimed, with a frown.

"Why?" I asked, in astonishment; and Tom laughed.

"Do you think I don't know who you are?" continued the enraged artist. "You are spies sent out to view the land; but I'll tell you what it is. I don't care for a hundred whipper-snappers like you. Mine's a customer trade, and I don't need to care for you. No rival can touch *my* connection!"

"Then why get so angry," said Tom, smiling; "seeing that you won't take a picture you may have no objection to take a cigar," and Tom handed his case to Peter, the photographer, who, being a smoker, took a cigar after a little pressing.

"We'll go into the garden and smoke," Tom said, "to keep the studio free of smoke."

"Oh! you may smoke here; I've no appointment today. I only take by previous arrangement. "And what brings you to photograph?" he continued, his bile evidently beginning to rise again as he paused between the puffs.

"Oh! we go in more for views than general portrait work," I remarked quietly, "so I don't think we can interfere with each other."

"Well!" he said, "I don't take views, so that's all right." He felt relieved and begun to converse freely. He showed us some of his finished work, which was remarkably good, but certainly nothing when compared with the general theoretical knowledge that he possessed. He had read up most processes, and had them stowed away in his "knowledge box," dormant and useless. "His fingers were all thumbs," as the saying is. He knew, but he could not work out.

Joseph could learn nothing here; but I fired a parting shot which made old Peter our friend for ever.

"If you have not many engagements just now," I ventured to say, "we might be able to put a few shillings in your way if you could give us a hand in the field work with our traps and chemicals."

He took it very kindly, and said that he would be very glad. Thus we made a friend of our rival. MARK OUTE.

## THE ENGLISH EXPEDITION FOR THE OBSERVATION OF THE ECLIPSE OF THE SUN.*

*In the Bay of Bengal,*
*On board the "Enterprise," April,* 14, 1875.

UNFORTUNATELY I have nothing very satisfactory to communicate about the fate of our eclipse expedition to the Nicobar Islands, and must touch upon things which I would rather let alone, but about which the interests of future expeditions do not permit me to keep silent.

I reached Point de Galle, in Ceylon, without mishap. The voyage was comparatively agreeable so far, in spite of the excessive heat. The places at which we touched before reaching Galle were known to me, but had not lost all their interest; but in Ceylon I had a sight of what was quite a new world—the tropical vegetable kingdom in all its luxuriant development—and this one glimpse repaid me more than a thousand times for all the fatigues of the voyage. I had seen beautiful palms in Egypt, but beside the cocoa-nut palms of Ceylon they appeared stunted and wizened; and it is not only palms that Ceylon can show, but many other wonderful trees, shrubs, grasses, and flowers for the first time delighted the eyes of the newly-arrived ones. The first view of Ceylon is like a beautiful vision—a sweet remembrance that never fades from the memory; it was the sweetest gleam of sunshine on our journey.

The expedition divided in Ceylon. Schuster went with Ladd and Beasley, the photographer, to Singapore; I remained in Galle, with Meldola and Reynolds, to wait for the man-of-war ship "Enterprise," which had left Calcutta on the 11th March with Professor Tachini and the Indian members of the expedition, Captain Waterhouse, and Dr. Pedlar, teacher of chemistry at Calcutta, on board. On the 17th March, the "Enterprise," a small but quick ship, arrived, and on the 18th we set out for the Nicobars.

The information which our new colleagues gave us about the Nicobars was not of a very cheering nature. The islands are exceedingly marshy, and we were obliged to take quinine every day as a precaution against fever. There was no physician on board our vessel. This astonished me greatly, the more so as we were sailing to an unhealthy station. I was told that they had wished to engage a doctor at Calcutta, but he had declined to come, so they would go to the Andaman Islands, where there is a military station, and "requisition" a doctor there. This, however, was not done, and we soon felt the want of a doctor most bitterly.

* This article has been in type for some time, but we have been unable to make room for it till this week.—EDS.

The stay on board the "Enterprise" was, to say the least of it, exceedingly uncomfortable. The ship was small, the best cabins were secured by those members of the expedition who had come from Calcutta, and we were put into a room in the stern. We were told that in India everyone had his own servant—in fact, each of the Indian members had brought his "boy" with him; but they might have known that we Europeans were not acquainted with Indian customs, and, besides, that when travelling we had had no opportunity of engaging a servant.

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On the 23rd March we reached the Nicobars. Here what threatened to be a fatal calamity overtook us. Tachini's assistant was seized with smallpox. He was unwell when we were in Ceylon, and if we had had a doctor on board he might have recognised the symptoms and have left the patient on land. Now we had him on board, and were shut up with a man having an infectious disease. On the Island of Camorta, where our station was, there is a colony of convicts. There, luckily, we fell in with an hospital nurse who came to the assistance of our sick one, but decidedly refused to let him be landed. The case was becoming critical when Herr von Roepstorff brought us help and advice. He was sent to Camorta to prepare for the expedition—a task which he accomplished in an excellent manner. He placed the invalid on board a lighter, and thus isolated him from us and from the colony as well. Herr von Roepstorff is a Dane by birth, but in sentiment he is completely German, and it did me good to speak my beloved mother tongue with him. After the somewhat stiff and bored tone which reigned on board I breathed freely in the cheerful German society of von Roepstorff and his wife.

In order to escape attacks of fever we were forbidden to sleep on land, and had to return to the ship every evening. Unfortunately this precaution was insufficient, for the captain, several of the officers, Tachini and I took the fever in spite of it. It will be seen at once that having to communicate with our station from such a distance was very inconvenient. A hillock close to the harbour, which Roepstorff had had previously cleared of wood by fire and axe, served as a station for our instruments. In his care for us he also caused several bungalows and an easy footpath to be made.

It was part of the plan of the English originator of the undertaking that our expedition should divide itself into two parties—one going to Mergui on the Burmese coast and the other going to Camorta. If one of these stations had bad weather the chance still remained that the other would have better luck. It was unfortunate that this plan was not carried out. In all six observers were clustered together on a little patch of ground in Camorta only in order to be prevented from working by a stormy cloud. Indeed, during the three weeks we stayed off the Nicobar Islands the weather was usually unfavourable for our purpose, and the choice of this station can only be described as altogether unhappy.

As I have already related, in spite of the promise of a telescope, the English equipped me with very insufficient instruments, the most important pieces being two lenses, which disappeared in Ceylon in an unaccountable manner; so there was I with nothing but my spectroscope, which, however important it might be, was useless without a telescope. The hope that the Indian members might bring me a telescope was vain; in fact, they did bring a mirror-telescope of Pogson's with them, but Dr. Pedlar advanced claims to it, and I was fed with the hope that from the abundance of pieces brought out perhaps several not otherwise required would be found which might serve my purpose. As England's guest I was obliged to live on the crumbs, instrumental *bien entendu*, which fell from the table of the rich. At last I got a rectilinear lens, by Dallmeyer, of three-inch aperture and nearly twenty-two feet focus. This threw a very strongly-lighted image of the sun about two lines in diameter. With the help of a Chinese joiner the objective was fastened to the end of a tube of wooden laths, and so a sort of telescope was constructed. At the other end of the laths I placed the spectroscope, so that the sun picture fell exactly on the chink. In this manner I got a dazzlingly-clear spectrum. The sun's rays were reflected upon the lens by means of a mirror set upon an equatorial stand. This made it possible to follow the sun by drawing the mirror along by hand, so that the sun picture would fall on the same place the whole time. My spectral apparatus (by Schmidt and Haensch, of Berlin) proved excellent; it was certainly the best there.

Meldola possessed a beautiful telescope, by Lockyer, that furnished a sun picture almost an inch in diameter. His spectral apparatus, however, was small, and with quartz prisms it only furnished a spectrum two centimetres long. Pedler worked with a mirror-telescope and a pliable, long, spectral apparatus; yet it did not give exceptionally-good pictures. Tachini only made eye observations. Waterhouse wished to take pictures of the corona only, not of the spectrum. For that he had a rectilinear lens of thirty inches focal distance, also furnished with machinery for following the course of the sun.

There were a great many difficulties to be overcome in the setting up of the heavier instruments. The parts that screwed into each other had to be placed together and corrected for the meridian. Many of the pieces had been broken during the journey or had got out of order. Then came the testing of the photographic chemicals—a work which was certainly not a pleasure with the thermometer at 26°; yet in this case the heat was the only thing we had to contend with. I used plates coated with gutta-percha, which kept remarkably well, and which I prefer to use in warm climates, as they save cleaning, which is hard work in this heat. As the island climate is damp the plates kept an astonishingly long time. Notwithstanding the heat I could expose for fifteen minutes without the film drying in patches. The collodion I used this time was the common collodion, the formula for which is in my handbook. It is unnecessary to have recourse to very alcoholic collodion. I acidified the silver bath a little more than when at home. Meantime I was diligently employed taking landscape views, for which wild nature in these islands furnished an abundance of subjects. Some of these I took with Wortley's dry plates. The dry plates I bought in England were not bad upon the whole; some, certainly, had specks and pinholes, others blistered spots, but the greater number gave useful pictures which were not far behind the wet plates. At first, though, about a dozen plates were destroyed in developing or exposing before the proper time for exposure and development was ascertained; but these plates can only be used with a due consideration for their price. Their sensitiveness is little less than that of wet plates.

So far, by dint of hard labour, everything was satisfactorily arranged in anticipation of the important day. This brought us to the 6th of April. The previous day we saw several waterspouts in the distance, which foreboded no good. On the day of the eclipse there were detached clouds in the sky, the number of which increased as the day wore on. Tachini was soon able to pick out the protuberances. He found them few, however. It is just now the time when the sun spots are poorest (the sun spots have a period of eleven years), so that the protuberances appeared few. At twelve o'clock we observed the contact of the moon and the sun; then a dense cloud slid in front of them and extinguished all our hopes.

The darkness at the moment of total eclipse was not very great; it was about as clear as by the light of the full moon, perhaps somewhat clearer. The failure of our observation is the more to be regretted since an eclipse of so long duration—four minutes twenty-two seconds—is not expected to occur again for a long time, and this promised to be a particularly successful undertaking. The apparatus which I had collected was so powerful that I obtained a distinct sun spectrum with it in a quarter of a second. Since the eclipse lasted four minutes twenty-two seconds I could have exposed a thousand times as long; that is, for one thousand quarters of a second—an exposure that should surely have sufficed to get a spectrum of even the faint corona. But the most careful preparations were of no avail. We had just to be resigned to the inevitable.

The failure of the observations was not the end of our troubles. Just before the eclipse the long-expected doctor arrived from Fort Blair—too late to be of much use, our smallpox patient having recovered meantime. The doctor discharged him fourteen days after the commencement of the illness—much too soon, as it appeared, for a sailor took the infection, and was banished to the lighter. Then a second sailor showed suspicious symptoms. We were not yet delivered from the dread spectre of smallpox.

After the eclipse there remained nothing for us to do but to pack up our instruments. In this unpleasant work we were assisted by the prisoners; but this help was suddenly withdrawn by Homfray, the superintendent of the island, under the pretext of a press of work. The consequence was that our work was prolonged, and our departure from the fever-stricken islands delayed. After that he shortened the working time of the few assistants allowed us, and on Sunday he took them from us altogether, though they were all either heathen or Mahomedans.

If the want of consideration involved in these proceedings had been energetically represented to Homfray it would surely have had some effect, as a protest of mine againt the removal of one of my workers had. Our Anglo-Indians, however, quietly endured the want of consideration now, in order to complain of it later, when complaints will no longer benefit them.

Hitherto scientific expeditions have been accustomed to receive a courteous, and even a respectful, reception from all civilised nations. It is left for proud England to learn that one of the most insignificant of her colonial functionaries has dared to treat contemptuously a scientific expedition sent out by the mother country. I relate the following speech, which is quite characteristic of Homfray. He remarked that "Heaven had sent the cloud to cover the eclipse out of displeasure, because all the astronomers were atheists."

On the 12th April we were at last able to leave the unlucky islands, and steered for the Andamans. But we were kept in quarantine, and not allowed to land, on account of a sailor on board being ill of fever. On the 18th twe shall, at last, reach Calcutta.

H. Vogel, Ph.D.

# Correspondence.

## THE ADDITION OF PARAFFINE TO COLLODION.

*To the* Editors.

Gentlemen,—Allow me to reply to your correspondent "T. Y." to whom you invite me to give information respecting how the paraffine is to be added to the collodion. In compliance with that request I beg to correct "T. Y's" notion respecting the solubility of the paraffine in alcohol and in ether. Supported by my own experience and by the opinion of the best authorities on chemistry, I consider that paraffine is but very sparingly soluble in cold, although considerably so in hot, alcohol, and easily in sulphuric ether.

I put a small lump of pure paraffine in a test tube, add some methylated alcohol, and warm over the spirit lamp. Very soon the paraffine is melted, and disseminated through the alcohol in the shape of liquid globules. After removing the test tube from the fire all the small particles of the melted paraffine collect at the bottom; but the clear, supernatant liquid contains a considerable quantity of the paraffine in solution. On cooling, the greater part of it will crystallise; but before that occurs I transfer the clear liquid to the bottle of plain collodion. The quantity necessary is very small. I judge of it by applying a few drops of the paraffinised collodion to the glass plate. If too much paraffine has been used the collodion will not set or form a film. In the next stage of saturation the collodion film breaks, and leaves the glass in patches. But if the right proportion be added the collodion film is of the usual quality, and can, after drying, be removed from the glass or from paper if it be of a suitable description.—I am, yours, &c., L. Warnerke.

10, *Linden Grove, Peckham Rye,*
*July* 27, 1875.

## CONTINUATING ACTION OF LIGHT.

*To the* Editors.

Gentlemen,—Will you kindly allow me a word or two regarding the continuating action of light?

I beg to submit that a substance that offers any obstruction to the free passage of light sets up a molecular action that does not cease on the removal of that substance from palpable light to what we choose to call absolute darkness. I must state that the orange glass with which we glaze our dark-room stops the actinic light only in proportion to the amount obstructed; the temperature of the glass will rise, showing that an invisible action is set up. Where this action ends I think is difficult to determine.

If I could get some of your very able correspondents to state how that light is transformed to heat, or to show that it is not light in another form, I should be gratified. We talk of light and darkness as if we understood them. I see no reason why, in the case of a sensitive film exposed to light, the action set up should not continue until the molecules regain their former position.—I am, yours, &c.,

*Penge, July* 28, 1875. H. Hunt.

## PHOTOGRAPHERS' HALF-HOLIDAYS.

*To the* Editors.

Gentlemen,—Will you kindly allow us to offer a few remarks bearing upon a letter in your last issue, to which the signature of Mr. W. Hanson, of Leeds, is appended, regarding the half-holiday movement?

We fail to see why Mr. Hanson should take exception to the statement in the report of the West Riding of Yorkshire Society's meeting, to the effect that the half-holiday was likely to become an institution in Bradford, Halifax, and Leeds.

The facts of the case are simply these:—More than a year ago the Bradford photographers introduced the practice of closing on one half day in the middle of the week, and organised a series of excursions in which employers and employed equally joined, leading to an amicable and friendly feeling amongst the profession of that town. When the West Riding of Yorkshire Photographic Society was organised the subject was brought before the members and freely discussed, each of the three towns mentioned being well represented at the meeting, and the decision was that a general half-holiday would be both desirable and beneficial. Without entering further into the arguments adduced it is sufficient to say that the Halifax photographers decided at once to join Bradford and have the holiday.

The publication of the discussion in the Journal led to the matter being brought before the Leeds professional photographers; steps were taken to convene a meeting for its consideration, and all the photographers in the town were invited to attend. We are informed that there were only two out of the number who objected, one of them being your correspondent of last week, who opposed it principally on the grounds that it would lead to, and induce, photographers to work on the sabbath. Now, with the example of Bradford and Halifax before Mr. Hanson, it is difficult to comprehend by what mental process he arrives at that conclusion. There is certainly no artist of any reputation whatever in either of those towns who opens on Sundays; and,

seeing that Bradford has tried the experiment for over a year, it is ample proof of the error of your correspondent's opinion. Besides, if such were the case, any artist who has a respectable business need not fear any Sunday work that may be done in his town. The class of people who patronise Sunday workers are scarcely those whom he would be very anxious to number amongst his patrons.

It is possible to imagine that a photographer who cuts down his prices to the lowest possible figure—say three or four shillings per dozen —might not be able to afford his *employés* the half-day; but surely your correspondent does not hold that position.

It is much to be regretted that the same amicable feeling does not exist in Leeds as in the other towns mentioned; but we trust that your correspondent will see that there is more to be gained than lost by the practice, besides getting rid of the disagreeable consciousness that he is preventing a large number of hard-worked assistants from enjoying that greatest of all boons to a town worker—a half-day in the country. —We are, yours, &c., J. Crosthwaite,

*July 28th*, 1875. R. Holgate,

*Secs. to the West Riding Society.*

## THE LAMBERTYPE PATENTS.

*To the* Editors.

Gentlemen,—I had decided not to take notice of all the little attacks of which my patents might be the object, knowing the latter to be solid enough to outlive here, as they did on the continent, all the doubts, threats, and insinuations thrown at them by envy or jealousy; but I am advised to answer, once for all, the letters published in last week's Journal so as to counteract the false impressions which might be left on the minds of your readers by the misstatements contained in those letters.

I write with reluctance, for two reasons: the first is that I have to use a language very little known to me; and the second and principal reason is that I know that a whole year's discussion on such a subject would be as useless and as tiresome to your readers as the one year's controversy of 1871 about Johnson's patent, which cost a great deal of ink and bile without altering in the least the merits of the case. That controversy might be continuing yet had you not thought it advisable to close it, so as to prevent it from becoming eternal.

All patented processes have their enemies, but with this difference: that if the processes are worthless they will have none but licensees to attack them. Parties who had not invested in them would not think it worth their while even to notice them. But if, on the contrary, the processes are all they are represented to be, licensees will be satisfied, whilst the few photographers who do not understand that brain-work ought to be as well remunerated as hand-work will run down those processes which they would very much like to use could they but have them for nothing; hence the rage against patents. Success usually creates enmity and jealousy; failure never does.

By looking through this week's advertisement it will be seen that our licensees are satisfied with the processes, and that the attacks against their novelty come from parties who, never having seen the practical working of our new methods, are not competent to judge of their novelty or superiority. Allow me to answer, in as few words as possible, the various letters of last week, beginning with Mr. Batho's article in your Journal of the 16th inst.

Mr. Batho seems to have as much knowledge of patent laws as he has love for my patented processes. Everyone claiming to have even a slight knowledge of patents knows also that *a patent taken out as a communication from a person abroad is as equally valid as a patent taken out by the original inventor;* and if Mr. Batho takes the trouble to read carefully the specification of the patent once more, he will perceive that my patents are *not taken in the joint names* of Lambert and Clark; but by Mr. Mellville Clark, patent agent and civil engineer, "*being a communication from abroad by C. L. Lambert.*" Mr. Batho continues by saying that "the invention must be new—not used before in a business sense, even by the inventor." Everybody knows as well as Mr. Batho that the invention must be new; but, although I cannot see what relation the last part of his phrase has to my case, I must say that Mr. Batho is completely in error, *if a process has been kept secret whilst being perfected, and used and known by none but the inventor*, as he will learn by taking the advice of patent authorities, who will also answer his other statement, viz., that "if a specification claims as part of the invention something not new along with something new it will invalidate the patent." It is so when there are two different and separate claims, one being new and the other not new; but *in a single claim you may describe two or more old things to make a new combination producing something or results not produced before, or to produce some known thing or effect better, or more quickly, or more cheaply than produced before.* For instance: you may describe two different known metals which by a new combination would produce a new sample of metallurgy. Bell metal is an example of this, and it would be a fit subject for a patent.

I here give an extract from an article by Mr. C. Stewart Drewry, of the Inner Temple, barrister-at-law, who is a high authority in patent matters:—

"There is, in reality, hardly any other test of distinction in a patent than that of superior utility, when inventions run, as they frequently do, so close to each other that the distinction between them, disconnected from their relative results, is with great difficulty appreciable. It must be recollected that superior utility logically involves difference, because process A can have a certain and specific effect, and no more; and if process B does something more than process A there must be of necessity a difference or there could be no additional action. It is therefore fair and, indeed, almost unavoidable reasoning that if you find process B producing a better effect than process A there is novelty, however trifling it may appear to the eye. The case of Crane *v.* Price may be thought to furnish reason for saying that superior utility affords a ground for inferring novelty. In that case it was proved that the process of using the cold blast in smelting furnaces with ordinary coal was common, so was the use of the hot blast for the same purpose. Anthracite coal or culm was also known, and the use of the cold blast for smelting with anthracite coal had been publicly tried, though unsuccessfully; but the hot blast had not been used with anthracite coal, and Mr. Gray's patent was taken for the application of the hot blast to anthracite coal, and the patent was proved to be a valid one. It is quite a settled law that a patent may be sustained for a new combination of old materials. A careful consideration of the cases upon patent rights will also prove that the question that courts of law look at is this—'*Is there a difference?*' If there is, then, though it may be very slight—if utility is shown to be the result of it—judges will not act upon any theoretical views drawn from their inner consciousness as to quantity of invention."

I claim an essential difference between Mr. Croughton's process, as described Dec. 24, 1873, and mine; and I can prove, practically, that utility and advantages are the results of that difference. Allow me to compare both processes side by side:—

| Lambert's Specification. | Croughton's Process, Described in December, 1873. |
|---|---|
| "What I claim as the invention by the hereinbefore in part recited letters patent is *the method of applying a semi-translucid sheet on each side of a negative or positive, and of quickly and rapidly retouching on these surfaces* as herein specified, which means, as will be seen in the specification, that I use in preference a thin paper, specially prepared with paraffine and subjected to great pressure, and known as 'mineral' paper, or any other semi-translucid materials capable of receiving the colouring matter to be afterwards employed. *On these two surfaces* I retouch by applying, wherever necessary, either on the collodion side or the reverse side, an impalpable galvanoplastic powder with stumps," &c. | "In elderly people the lines and texture of face is far too marked in the enlarged negative; *this can be softened and reduced by printing through tracing-paper.* Strain the tracing-paper over the face of the negative, so interposing a thickness of tracing-paper between the sensitised paper and the negative. I always strain tracing-paper on the reverse side of the negative, as it serves to soften the printing and is a capital medium *for working upon with pencil* to strengthen high lights. "I can also deepen the shadows of drapery by *using a brush dipped in Canada balsam* one drachm, benzole one ounce, thus making the paper more transparent in these parts; the light acts more quickly, and a great depth of shadow is the result," &c. |

Now it will be apparent to any fair-minded photographer that Mr. Croughton's process consists simply *in retouching with pencil and Canada balsam on a tracing-paper strained on the reverse side of a negative and printing through tracing-paper strained on the face of the negative, without retouching on this sheet, which simply reduces and softens wrinkles, &c., by printing through this tracing-paper.* My process is as different to this as a negative is different from a positive. On every negative—even landscape negatives—where there are no wrinkles or texture of faces to soften, we strain a sheet of mineral paper on both sides—not so much to print through, which will soften and reduce necessary details of hair, lines, &c., as much as wrinkles; but *we use the two sheets as simple vehicles for retouching* with impalpable powders applied with stumps. The mineral paper thus employed on both sides of the negative has the effect of neutralising, by its optical combination, the defects due to the material of which it is composed, and which, when seen separately, exhibits an exceedingly coarse grain.

I will now show the "utility" which results from the difference existing between my process and that of Mr. Croughton's. In Mr. Croughton's method all the retouching being done on the paper strained on the reverse side of the negative will, being necessarily out of focus, produce muzziness and not softness; and his application of Canada balsam on the same side to produce density will not only annihilate the pencil retouching already done, but will also, in rendering the paper on the reverse side of the negative translucid, allow the grain of the paper strained on the face of the negative to print and produce a coarse print.

I claim, furthermore, that it is impossible to produce gradations of lights or densities by using the Canada balsam, as all oily matter will spread on paper. The intensification of a life-size head with the hard point of a pencil, as in Mr. Croughton's method, would take a hard day's work, whilst the application of galvanoplastic powder applied with stumps will instantaneously produce intensification and give prints completely free from grain, *provided there is also retouching on the paper placed on the other side.*

I claim, furthermore, that the retouching only on the paper strained on the reverse side, even with stumps and powders, will produce but very poor results—never to be compared to results obtained when the retouching is on both papers, as in my patent, for these very good

reasons—that spotting and details must be in focus or made on paper strained on the collodion film, whilst intensification and broad effects of lights or shadows must be soft and necessarily out of focus, or obtained on paper strained on the reverse side of the negative. Any practical photographer will see that there is an essential difference in the processes, and that utility and advantages can be proved to be the result of *the use of two papers, one on each side of the negative, and the retouching quickly on these two surfaces as herein specified*, which is my claim; so it is not necessary for me to go into further details.

Not wishing to tire your readers any more with further discussion on these subjects, knowing them to be quite useless, I will give Messrs. Samuel Fry, Slingsby, Brothers, Batho, or any photographers sharing their opinions, a fair and honest chance to prove by works, instead of playing on words, the truth of their statements and insinuations. Independently of my standing challenge in this week's advertisement, and so that the amount risked be not a bar to acceptance, I offer the following test of the relative value of Mr. Croughton's and my processes. Messrs. Fry, Batho, Brothers, and Slingsby claim they have worked Mr. Croughton's process six months longer than I have practised mine; hence they must be as good, if not better, operators than I am, so there is no reason for either of them or for Mr. Croughton himself refusing to accept my offer :—

I propose that one of these gentlemen, unless they prefer testing the validity of my patents in competent courts of the land, will come to London, and from a given negative, or transparency, or card, to produce by the process described by Mr. Croughton on December 24, 1873, all the different results I will obtain by my patented processes—the judges, the work to be done, &c., to be as explained in my standing challenge. If the party accepting this trial succeed by Mr. Croughton's process in producing as good and as permanent results with all changes, &c., required as those I will obtain by my process in the same length of time, I will pay £50 now deposited in the London and County Bank, Deptford. If the other party do not succeed he will lose nothing, but will have proved that my processes will give better results than Mr. Croughton's method, and prove definitely the worth of my patents.

I will not pay the £50 towards erecting a pyramid, mosque, or such little trifles to Mr. Croughton as suggested by Mr. Slingsby, although Mr. Croughton has no greater admirer than myself; neither will I pay the £50 to swell Mr. Slingsby's conspiracy fund, as such a fund is illegal; but I will remit the money to the London Photographic Society to be used for such benevolent purposes as they may elect. As the party accepting this trial risks nothing, I will consider any further attacks on the validity of my patents from parties not daring to meet me on fair ground as cowardly and not worthy of further notice.

In answer to Mr. Brothers I will simply state that it requires *no* "artistic skill" to intensify high lights or shadows already apparent, which is the case in my processes, and which require no drawing, but simple tracing, to produce the effects.

I must also state that Mr. Samuel Fry, of Surbiton, makes an erroneous statement when he says he saw the practical demonstrations of the Lambertype process, which took several hours. This is not correct; for, knowing in what capacity this gentleman came, I simply showed him, as I did everybody else not a licensee, the results of the Lambertype process, and allowed him to assist in the printing and developing of chromotypes. I can prove that *Mr. Fry did not see the working of the Lambertype* by the six photographers who were present, and of whom he speaks so flatteringly in last week's Journal.

I am glad to see that, although my patents are attacked, not one has yet had the courage to deny the great advantages offered by my processes and special materials. Until my offer of a fair test of the two processes in question is accepted I will consider this controversy at an end.—I am, yours, &c., LAMBERT.

*Greenwich, July* 28, 1875.

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*To the* EDITORS.

GENTLEMEN,—Things which differ from each other are, I think, seldom found to be the same—a circumstance suggestive of the desirability, at anyrate at times, of making some sort or manner of distinction if we can. Mr. Brothers, it would seem, has used *one* paper and "fiddled" upon *that*, whilst M. Lambert uses *two* and "fiddles" upon *them*. *This* "caper," to be sure, may be anything but new, but, if so, the fact is scarcely proved by the antiquity of *that*.

"Secret" and "patent," again, are words which your correspondent should not use as if they meant the same. Imagine, for instance, the ghostly "majesty of buried Denmark" alluding in pathetic terms to the *patents* of his prison. "'Tis true, 'tis pity, and pity 'tis 'tis true," that "secret process-mongers" should be apt to "take us in." It is not, however, "in accordance with the custom of the house" that they should be overready to complain of this themselves. Mr. Brothers, it is possible, may scarcely look upon himself as a member of the class. My memory unhappily, is bad, and in the present, as in other instances, may lead me quite astray; but, dimly discerned upon its fading tablets of the past, I trace your correspondent's name boldly writ upon an advertising page as a member of the body at which he now is pleased to sneer.—I am, yours, &c.,

*Blackpool, July* 26, 1875. D. WINSTANLEY.

## A MODERN ATHENIAN ON THE EDINBURGH PHOTOGRAPHIC SOCIETY.

*To the* EDITORS.

GENTLEMEN,—It requires considerable moral courage for an individual outsider to criticise the sayings and doings of a corporate body possessing the respectable prestige of the Edinburgh Photographic Society. It is often a thankless task. Still, if *his* motive be good, and *they* but slenderly endowed with the gift of seeing themselves as others see them, the result may, after all, turn out beneficial to both parties.

It has been noted by botanists that you may increase the sweetness of the rose by planting garlic near to it; the latter, by absorbing certain deleterious juices from the soil, assists the Queen of the Parterre to maintain her throne with greater magnificence and increased loyalty. So may it be with this Society. I trust, therefore, that *leo in vinculis* will not despise the good offices of a friendly rodent like your humble servant, but exclaim—"Sweet are the uses" of adverse criticism, "which, like the toad, ugly and venomous," &c., &c.

What time the pea puts on the bloom and the singing of birds is come the Edinburgh photographers have adopted the wise practice of closing their places of business annually for a day for holiday purposes; and if there be a class of people who need relaxation and change of air and scene more than another it is an *irritable genus* like the photographer. Away from the chamber and dusty hearth and all its associations, the studio and all its worries, he is glad to fly to some rural sanctum, and there alone, or with one or two choice friends, he may rest his weary eyes on nature's greenery, or enjoy on a heathery knoll "the soft recumbency of outstretched limbs." No festive scenes of dissipation can now allure except it might be the butterfly's ball or the grasshopper's feast, where a master of the ceremonies is unknown. Halcyon peace broods with downy wings on his ruffled spirit and soothes his jaded nerves; all sounds are hushed—

> "Save where the beetle wheels his droning flight,
> And drowsy tinklings lull the distant folds."

This kind of thing, however, is far too sentimental and "slow" for a certain class of Edinburgh photographers. A race has sprung up that knows not Joseph, and to that class

> "A primrose by the river's brim
> A yellow primrose was to him,
> And it was nothing more."

What pleasure their West Riding brethren can have in "a drive along narrow lanes blue with forget-me-nots and wild hyacinths" they cannot divine; the "canawl is their holt," as Artemus Ward says, for there beer-process photographers may find an odoriferous bath, and cats and dogs find inglorious sepulture.

Frowsy canal boats, euphemistically denominated "barges," which can be used as a dancing-saloon or "converted into a comfortable dining-hall," are engaged, and, it is believed *leased* for four years, and there, closed under hatches, for about the space of a half-holiday, all goes "merry as a marriage bell" with seventy human beings, all told. The voluptuous swell of a concert "piano and string band" summons up the "master of the ceremonies," who poses the President, who opens the ball which was to "come off." Their dinner, we are told, was "washed down by a liberal allowance of champagne, &c." No wonder they became incapable, and could not sit for their portraits; the miracle is that all the excursionists did not become "ash tronk ash peegs" and unfit for work next day.

Time and your own valuable space would fail me to describe the "games." How the gentlemen raced fifty yards on one leg, and the ladies the same distance on two legs. Who was championess at the skipping ropes; who carried off the watches and the jumping-jacks and ate the oatmeal—are they not chronicled in the archives of the Society and photographed in their memories?

The proceedings, as reported in your columns last week, are, I think, vulgar in the extreme, discreditable to the Society, and unworthy of those who claim to be the devotees of an art-science, who ought to be the *avant-coureurs* and intelligent exponents of a new and noble art-feeling, unparalleled in this century, which has refined and elevated the taste of all classes to an incalculable extent, and produced an ever-growing demand for all that is "pure and lovely and of good report."

One word to the liberal "donors," and I am done. May I venture to remind them that there exists in London a very laudable charitable society for the relief of indigent brother photographers, which, I understand, is sadly in need of funds. Estimating the liberal supply of champagne to the seventy excursionists at the moderate capitation price of five shillings, the product is £17 10s. I have no doubt that if even half that sum were collected on the occasion of the next annual holiday, for such a praiseworthy object as that alluded to, they would earn the everlasting gratitude of those kindly gentlemen who manage the funds, and increase their own enjoyment. I know some who will not be slow to act upon this hint, and wonder it did not occur to themselves; "for in this world of nought more evil is wrought from want of thought than even for want of heart."—I am, yours, &c.,

*Leith, July* 21, 1875. A. W. STEELE.

## EXCHANGE COLUMN.

A gentleman's gold watch will be given in exchange for a 10 × 8 portrait lens by Ross, Dallmeyer, or Voigtlander.—Address, R. H. Dyball, 3, Lower-terrace, Notting-hill, W.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

Photographs Registered.—

James Huntley, South Shields.—*Five Pictures of the Dog, Wandering Willie.*

Jules De Meilhae, Scarcorough.—*Portrait of the Rev. W. Waugham Yarworth.*

John Scott Barclay.—Such a committee as that about which you inquire does not exist in London. If such were the case we should most assuredly have heard of it.

K. L. M.—Both tea and coffee may be used for the purpose of developing plates, and a period of nearly twenty years has elapsed since we first exhibited negatives developed by tannin.

H. W.—From an announcement elsewhere you will see that the London Photographic Society's Exhibition will be opened in September, not October, as was inadvertently stated in a previous number.

B. J. Cavanagh.—The information you seek may be obtained by consulting the pages of our Almanac for 1873, which, however, we imagine you will experience a slight degree of difficulty in obtaining.

E. N. O.—The collodion is much too thick for glass positives. More beautiful results will be obtained if it be thinned by the admixture of nearly an equal bulk of a half-and-half mixture of ether and alcohol.

Vox Humana.—Such a handbook of the collodio-bromide process as you describe was published by Messrs. Mawson and Swan three years ago; but we imagine that the processes therein described have been superseded by others.

W. T. Brown.—We are not only quite well acquainted with the process by which the really beautiful enamel of which you speak was produced, but, what is of more importance, we have already published full details of the process.

T. H.—Develope by first wetting the surface with water, and then applying a three-grain solution of pyrogallic acid, to which has been added a few drops of a ten-grain solution of citric acid and nitrate of silver. The image will appear with great rapidity if the exposure have been sufficient.

N. Gillespie.—The same means are open to you as are to ourselves for arriving at the truth of Colonel Wortley's assertions relative to the virtues of nitrate of uranium. As he has declined to give any definite formula you must for yourself draw your own conclusions from all that has been published.

P. S. Smith.—1. The yellow stains on the prints are caused by the weakness of the hyposulphite-of-soda fixing-bath.—2. Lay the print on a hot plate of metal and rub it over with bees'-wax, which will melt and become absorbed by the paper. Apply one or more sheets of blotting-paper so as to absorb the superfluous wax.

C. G.—1. The precise quantity of gold calculated to tone a sheet of paper depends entirely upon the nature of the print and the length to which the toning is carried. A grain of gold to each sheet is an approximate estimate. —2. If care be taken, the hyposulphite and gold mixture will answer, but the other is the safer method.

John Gunston.—We have tried your emulsion but have failed in obtaining a picture with it. The emulsion was of a brown colour when we received it, and the films made by its means are precisely like brown paper. We shall subject it to another trial when we have leisure; but, in the meantime, we advise you not to use any that has been prepared in a similar way.

R. T. J.—That the ridge-like lines are owing to some defect in the collodion we feel convinced, but what the precise nature of that defect may be we are uncertain. We think your estimate of the behaviour of emulsion plates upon distant mountains is scarcely correct. It is only true of some, not of all emulsion processes. The manufacturer of your plates will doubtless give you a clue as to the markings.

F.G.S.—It would be unwise to take the developer in a made-up condition. It will be much better to make a concentrated solution of iron of such a strength that the addition of a given part of water will reduce it into working condition. When a photographer goes out with a tent for an excursion of only a day, or for a few miles, the case is quite different. Everything should then be prepared and put into working order before leaving home; but it becomes altered when the scene of operations lies in the vicinity of Scutari.

S. S.—To prepare plates by the gum-gallic process:—Coat with collodion and sensitise in the usual way; then wash thoroughly, finishing with distilled water, and apply a three-grain solution of gallic acid. After draining apply the following:—

| | |
|---|---|
| Gum arabic | 20 grains. |
| Sugar candy | 5 ,, |
| Distilled water | 1 ounce. |

The solution must be filtered. Plates prepared in this way keep well, and yield fine negatives.

D. Malcome.—A very popular and excellent cement for glass and china is prepared by dissolving gelatine or isinglass in acetic acid—Beaufoy's acid will answer. The following is a recipe for "diamond cement," which is said to be excellent:—Dissolve an ounce of isinglass in six ounces of water and boil down to three ounces, to which add three drachms of rectified spirit. After boiling for a minute or two add half-an-ounce of a milky emulsion of ammoniac and five drachms of tincture of mastic. There are numerous other recipes for similar cements, but these, we imagine, will answer your purpose.

Emulsions.—We have received a sample of new emulsion from Mr. Mawdsley, on which, together with a sample of oleo-bromide emulsion received from Capt. Fox, we expect to be in a position to report in our next issue; for the weather, so long unpleasant, is now highly favourable to the pursuit of out-door photography.

Auto.—Although we are unable to give any definite idea concerning the construction of the American lens respecting which you inquire, we think it not improbable that it is of a character similar to the rapid rectilinear. The name affords no clue to the construction; for we are acquainted with the lens just mentioned under at least five different names, each maker or dealer giving such designation as he thinks proper.

M. D (Grange).—The grouping has been effected in a most artistic manner, but with this remark our expressions of praise must terminate; for the focussing is very imperfect, the light not at all well managed, and the manipulation such as to show that there is very much room for improvement. As you have requested us to speak plainly we do so. Try again, but before doing so make some arrangement by which the light will be more under control; and to this end secure the aid of sheets, blankets, or other means by which the strong light on the left will be subdued.

Received.—Mansell and Co.

The Brussels Exhibition.—A friend who is at present in Brussels, has sent us some notes of the exhibition now open in that capital, which he considers good upon the whole, and not unlike the London exhibitions. Although it was open on the 19th inst., the catalogue is not yet published; hence, as our friend writes, an attempt to review the pictures is at the present stage almost an absurdity.

The Photographic Society's Exhibition.—The annual Exhibition of this Society will be opened on the 28th of September. It is to be held in the rooms of the Institute of the Society of Painters in Water Colours, 5, Pall Mall East, and will remain open until the 20th of November. Intending exhibitors must send in their pictures on September 20th, or on one of the three days immediately following.

Photographs of Children.—Mr. Hicks, of South Shields, has favoured us with a packet of *cartes* of children's portraits taken by him, the posing and manipulation of which are really excellent. The photographing of children is necessarily a difficult branch of the profession, owing to the twisting, turning, and general restlessness of the tiny sitters; but whether by good luck or, as is more likely, by skill Mr. Hicks has certainly achieved great success with his little clients.

Vanderweyde's New Method of Lighting Studios.—A number of members of the press and others have been invited by Major Vanderweyde to inspect the studio of Messrs. Fradelle and Marshall, which has been fitted up under the patent obtained by the former gentleman, and to which reference was made in these pages a few weeks ago. We shall in our next number give a detailed account of the Vanderweyde system of lighting studios. It will be observed that we have in the foregoing sentence given a military prefix to the name of the patentee, instead of the merely civilian one hitherto used. The titular prefix is unquestionably correct, for Mr. Vanderweyde, although preferring to be known as an artist rather than as a military man, has seen more service in the latter capacity than falls to the lot of most men. Swinton, in his *History of the Seventh Regiment, National Guard (New York), During the War of the Rebellion,* gives a "Roll of Honour," from which we make an extract that will be interesting, as serving to show that there are other weapons than the brush, and other fields than the journals devoted to photography, through which distinction may be sought and won. After giving the dates of his various steps in promotion in the field, step by step, "Major Henry Vander Weyde," says the author already named, "was brevetted for gallant and meritorious services. Took part in the battles of Lewinsville, Yorktown, Williamsburgh, Fairoaks, Seven Pines, Malvern Hill, second Bull Run, Antietam, Williamsport, Fredericksburgh, Marye's Heights, Salem Heights, Gettysburgh, Wilderness (where he was captured but escaped), Spottsylvania, North Anna, Cold Habor, Petersburg, Winchester, Fisher's Hill, Cedar Creek, where, his horse being shot under him, he was thrown down and captured; imprisoned at Libby and Danville; exchanged February 22, 1865; mustered out August 1, 1865; served as *aide-de-camp* on staffs of Generals Wheaton, Russell, and Jackson. Was honourably mentioned. General Hamlin wrote:—'He has greatly distinguished himself by his exceeding gallantry in every action; I know few men whom I can so conscientiously recommend.' General Wheaton says:—'A brave and accomplished soldier, having served upon my staff, in battle and in camp, with great credit.'" With the above quotation we take leave of the *soldier* who has survived twenty-one actions, some of which were appalling in their sanguinary results, and henceforth see in him only the *artist*—for as such he modestly prefers to be known—who, as the inventor of an effective method of stippling backgrounds, and as an exhibitor in oils in the Royal Academy, has already been suitably recognised, as we have no doubt he will also be as the inventor of a new method of lighting studios calculated to prove beneficial.

## CONTENTS.

THE BRITISH

# JOURNAL OF PHOTOGRAPHY.

No. 796. Vol. XXII.—AUGUST 6, 1875.

## PYROXYLINE.

For at least a dozen years subsequent to the general adoption of the collodion process the substance whose name stands at the head of this article was regarded by photographers with the greatest interest, and was the subject of much experiment and discussion. For a considerable period each operator considered it necessary to try his hand at its production, and in consequence of its not being, in the strict sense of the term, a definite chemical compound the resulting products were almost as varied as the manipulators were numerous. By and by, however, the conditions under which a fairly suitable article could be produced were discovered, and both it and the collodion made with it became regular articles of commerce, the result being that at the present time few photographers ever think of making their own collodion, and fewer still care to undertake the manufacture of pyroxyline.

With the advent of "dry collodion plates" the interest in pyroxyline became somewhat revived, as it was considered by many workers that the collodion best suited for wet, fell considerably short of perfection when used for dry, films. By the use of weak acids at comparatively high temperatures a pyroxyline giving a powdery film was readily produced which seemed to answer the purpose very well, and for a considerable time little or nothing has been heard of a difficulty in obtaining a suitable collodion for any of the ordinary dry processes. In fact, we suspect that the manufacturers of collodion generally have discovered that such pyroxyline was equally advantageous for wet-plate work, as for some years we, and we believe dry-plate workers generally, have found most samples of the usual commercial collodion in every way adapted for ordinary dry work.

Photography, notwithstanding, continues steadily to progress, and new processes require considerable modifications of *matériel* previously found to be satisfactory. The problem of how to produce an emulsion that will keep indefinitely, and which requires only to be poured on and off the plate to be ready for exposure, has been satisfactorily solved, and already hundreds of landscape photographers in our own and other countries are busy at work in that direction. But while we hear of much success in the working of the comparatively new system, we also hear of failures, and that to such an extent as to warrant the belief that they are not to be traced to the process, which is in reality simplicity itself, but to some of the materials used in the preparation of the emulsion. We are aware that emulsion that works in every way satisfactorily is already an article of commerce; but, while operators are in what may be called a transition state, it is only natural that they should wish to make the article for themselves, and here lies the difficulty. Long since our best authorities on emulsion work called attention to the fact that the highest success was very much dependent on the obtaining of a suitable pyroxyline, and we know from our own experiments and from the experiences of amateurs in all parts of the country that their statements have been fully corroborated. It is an axiom in the commercial world that demand will always create supply. We have no doubt that, by and by, the case of a suitable pyroxyline for washed emulsions will be no exception to the rule; but, in the meantime, we know that it is an article very difficult to be obtained, although, with ordinary care, not difficult to make.

During some recent experiments with emulsions we experienced this difficulty in no inconsiderable degree. Our early experiments were made with a sample of pyroxyline obtained from a firm commercially engaged in the preparation of emulsion plates. We are not aware how it was made, but it was much superior to any pyroxyline we have been elsewhere able to procure. It was perfectly soluble giving a bright solution, and an emulsion which, even without the usual substratum, adhered firmly to the plate during the operations of development, fixing, and washing, while the most desirable printing density was easily secured with alkaline pyrogallic acid. When the supply of this excellent pyroxyline was exhausted we procured first one sample and then another till we had tried the productions of most of the principal manufacturers, without any satisfactory result; and, as everything else was the same as had previously secured success, we can well understand that an amateur making his first emulsion experiments might have abandoned the process as unworkable. One sample gave sufficient density, but no adherence, even with an albumen substratum; another sufficient adherence, but insufficient density, although intensified with acid pyro. and silver; while a third, in addition to several objectionable qualities, seemed to promote the formation of a bromide compound that was nearly insoluble in hyposulphite of soda, and even cyanide of potassium could hardly be made to clear the film.

It is hardly conceivable that this state of matters will long continue. Our "experts" in pyroxyline-making have only to turn their attention to emulsion requirements to produce the desired article; but, till that is done, we would direct the attention of our readers to the formula by which we have during the past few days repeatedly made a pyroxyline that seems to leave nothing to be desired. But we should premise that it is not by any means new, as it was published at page 508 of our volume for 1873. It was then found to answer admirably for ordinary emulsions, and we can confidently say that it will be found equally suitable for the more modern washed emulsions.

Ten ounces of finely-powdered and dried nitrate of potash is placed in a suitable porcelain dish. On this is poured twenty ounces of sulphuric acid, s.g. 1·824, and the whole well mixed and pressed between two slips of glass till all the lumps of nitre are broken down. The vessel is then heated on a sand-bath till the temperature rises to 75° C., when the heat is withdrawn and four hundred grains of cotton added in the usual way. The action must be continued for ten minutes, during which it is necessary to watch the operation closely, as the acids are almost at the point at which they dissolve the cotton with evolution of red fumes. When this occurs it must be instantly stopped by rapid pressure with the slips of glass. At the expiration of the ten minutes the cotton must be rapidly transferred to a large supply of water, and washed and dried in the usual mode. It must be particularly borne in mind that the cotton used for this purpose is not that generally used, which has been cleaned and, in some cases, bleached, but the ordinary commercial article just as it is delivered in bales in this country, with portions of the stems and bits of the capsules adhering.

If the operation have been properly carried on the resulting product will be short, but not very powdery, and of a slightly yellowish

colour. It is not completely soluble in the ether and alcohol; but the undissolved portion readily falls to the bottom of the bottle, and the bromised collodion, though slightly opaline at first, becomes quite bright, notwithstanding its retaining a pale straw tint, in a few days.

Without prejudice to the various modifications by which emulsions giving very great rapidity may be made, to those of our readers who are content to give exposures of minutes rather than seconds we confidently submit the following formula as one that, in our hands, gives an emulsion in every way satisfactory, the plates prepared by which, while pretty sensitive, allow considerable latitude in exposure, and are easily developed into dense, clean, and crisp negatives:—

Each ounce of collodion contains six grains of dried bromide of cadmium and three grains of bromide of ammonium. This is sensitised with exactly twelve grains of nitrate of silver, and at the end of twenty-four hours has added to it twenty drops of a thirty-grain alcoholic solution of tannin. After another period of twenty-four hours the emulsion is poured on the plates, washed and dried in the manner recommended in our number for July 9th, and the pellicle thus produced will be found to give an emulsion which leaves very little to be desired.

## COAGULATED ALBUMEN AND BROMISED PLATES.

Of all the various scions of the collodio-albumen family there is none that can surpass in the soundness of its principle that which has been somewhat inelegantly styled the "hot water process," which, as our readers are doubtless aware, was discovered by Dr. Ryley. Owing to the great value of this process for rendering distance, we have recently been making a number of experiments with albumen applied to purely bromised films, selecting for these films one or other kind of emulsion. The hot water process in its original form, we may state, consists in applying a wash of diluted albumen to a washed, sensitised plate, and then effecting the coagulation of the albumen by immersion in hot water. The film thus becomes impregnated throughout with insoluble albumen, which also covers the surface of the haloid silver salts. If a wash of gallic acid be now applied plates thus prepared keep well—at least for many months—and yield exquisite pictures.

Our experiments with Dr. Ryley's preservative were made both on an emulsion of the usual description—that is to say, one that *necessitated* subsequent washing and organifying—and also on a washed emulsion; that is, one that yielded a film ready for exposure without any subsequent operations.

With respect to the former kind of emulsion, a negative was obtained quite equal in its clear rendering of distance to a collodio-albumen negative prepared with the bath, while the vegetation and everything else in the picture showing contrasts of colour (several flower-beds occupied the foreground of the subject) was much superior. When an emulsion plate, organified with albumen in this way, was compared with one treated with the usual or original tannin preservative there was a decided difference apparent; the quality of the former strongly reminded us of that obtained by Mr. R. M. Gordon in the negatives made by his as yet undivulged process. As a result of the latest experiments we have made in this direction we hope soon to obtain further advantages, after which we shall give full details of the whole process.

The *washed* emulsion of which we made use in our comparative experiments was a sample we had recently received from Mr. Mawdsley, and as it had proved so very excellent when used alone we thought it a fitting specimen of emulsion to subject to the hot water treatment. Accordingly six plates were prepared —three with the emulsion alone, no washing or preservative being employed; the other three receiving first a thorough washing after being coated, then an application of alkaline albumen (one part of albumen to three of water, to which were added twelve drops of ammonia), followed by immersion for ten seconds in a vessel of boiling water.

The result of the trial is this—that in no respect whatever does the washed and organified emulsion gain by the subsequent application of albumen, the quality of all the pictures being quite equal; but those coated with albumen took rather longer time to develope and in all there is an appearance as if the sensitiveness had been very slightly impaired by the subsequent treatment with albumen. The whole of the negatives, however, obtained by the Liverpool emulsion just referred to were very fine. Bearing in mind some curious effects resulting from the application of heat to bromised films when we were present during the progress of some experiments conducted by Mr. Stillman, we purpose repeating these trials with albumen, but making use of some agent to effect its coagulation without heat. When these experiments shall have been made we shall again report progress.

## ON REDUCING AGENTS.

This subject is one which is most intimately connected not only with development, but also to a great extent with the preparation of dry plates. It may also be considered as affecting most materially their rapidity as well as their keeping qualities. It behoves us, therefore, to consider carefully in which direction will be found the most favourable conditions for securing the fullest effect of such substances.

We do not propose to notice the use of reducing agents for the purpose of development, but to confine ourselves to those substances which are usually employed as preservatives in the preparation of dry or moist plates. Of these the principal are tannin, gallic acid, pyrogallic acid, and others of a similar character. Until late years these substances were only employed in the *absence* of free silver, and under such circumstances could scarcely be entitled to the term "reducing agent," the function performed being merely mechanical.

Since, however, the introduction of emulsions containing free silver, and, more recently, of Mr. M. Carey Lea's modified chloriodo-bromide process, such substances as tannin and gallic acid have been employed in the presence of free silver, necessary precautions being taken to restrain or prevent the reduction of the metal in the sensitive film. As, for instance, in the case of a film of silver bromide with free nitrate dipped into a bath of tannin without previous washing, the effect would be the discolouration of the entire film by the formation of a dark, insoluble precipitate of tannate of silver; but this is prevented by the presence in the film of a certain proportion of free acid, as is usually the case in emulsions of this description. In Mr. Lea's process the partially-dried pellicle is treated with a very acid solution of tannin or gallic acid, or both, the acid restraining the action of the reducing agents until the free silver has been dissolved out.

It is obvious that in these instances the effect produced by tannin or other similar substance must be far more powerful than when no free silver is present; for with the usual amount of washing given to the plates or pellicle it is impossible to suppose that the whole tannate or gallate of silver can be removed. It seems to be almost certain that a small proportion of some compound salt remains in the film in a soluble and comparatively colourless state, conferring certain qualities which are absent if there be no soluble silver salt present to enter into combination. This view is borne out by the behaviour of the pellicle prepared by Mr. Lea's process; for, unlike the ordinary pellicle prepared with excess of bromide, and which dries a pale yellow colour, it takes, when desiccated, a dark slate or brown tint, proving that some special combination has taken place.

We were induced, some time ago, to inquire into this matter in consequence of the behaviour of an emulsion containing free silver, and to which we had, inadvertently, added a quantity of another *washed* emulsion containing tannin. Contrary to our expectations the mixture did not discolour, and in seeking for the reason it struck us that the presence of free nitric acid was sufficient to account for what at the time we considered a phenomenon. We had little expectation that the emulsion would be of any further use, and upon testing it, by coating a plate and washing it in the usual way, we found that the film discoloured in the course of washing to a light brown. A little reflection, however, brought us to the conclusion that this arose from the acid being washed away before the tannin and silver had been eliminated, and we were led to repeat the trial, acidifying the washing water until all trace of silver had disappeared. We then obtained a plate without the slightest discolouration, and which, after

exposure and development, gave a picture faultless as regards density and very sensitive, surpassing in these respects the emulsion without tannin.

Upon repeating the experiment, without washing the plate, the film appeared to possess great sensitiveness; but it was found impossible to prevent fog in developing. The density obtainable was greater than we have seen with any form of washed emulsion. This mixed emulsion was poured out and treated according to the directions given by Mr. W. B. Bolton for the preparation of dried pellicle, the result being in every way satisfactory. We unfortunately, however, had no opportunity of trying the keeping properties of the emulsion.

Looking back at this experience we thought it might be worth while going over the matter again in a slightly different direction; and we have been recently engaged in a series of experiments with a view of determining the effect of various reducing agents in emulsions containing free silver, and also, if possible, of improving the means we already have at our disposal. To this end we prepared a quantity of emulsion from a sample of pellicle prepared with excess of bromide. To separate portions of this were added, respectively, tannin, gallic acid, and pyrogallic acid, while each received, also, an addition of three drops of nitric acid and one grain of nitrate of silver to each ounce. Another portion was treated with only the acid and silver.

Plates were prepared from each emulsion, and also from the plain sample which formed the basis of the rest, and were exposed for comparison. The results were decidedly in favour of those plates containing organic matter, gallic acid giving the best result, tannin, plain emulsion, pyrogallic, and plain emulsion with silver following in the order named. The quantity of reducing matter added was increased from a quarter of a grain to two grains to each ounce, the best results being obtained with about half-a-grain. We have not yet had time to try the keeping properties of these emulsions, but are retaining them for that purpose.

We varied the experiment by sensitising a collodion with sufficient silver to leave an excess of about six grains, adding three drops of *aqua regia* to each ounce. Twelve hours after sensitising one grain of gallic acid per ounce was added, and the emulsion poured out in the usual way. The washing waters were strongly acidified with acetic acid until no trace of silver was to be found, and the process completed by washing away the remaining acid. The resulting pellicle was similar in appearance to that obtained by Mr. Lea's process, and was found to be decidedly superior to the pellicle prepared with excess of bromide both in sensitiveness and density. In this case there can be little doubt of the keeping qualities of the second emulsion, as it contains no soluble matter. We think this will be found a more convenient plan than Mr. Lea's, and, as far as we can see, very little, if any, inferior in its results.

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In a private letter which accompanied Mr. H. J. Newton's communication (page 378) that gentleman calls our attention to a misreading of the directions given by him in his previous articles. At page 316 we expressed a doubt as to whether the solution of pyro. could be "*kept* and used repeatedly." Mr. Newton now explains that he had no intention of recommending the solution to be used from day to day, but merely wished to place it on record that the same pyro. solution might be used for the development of several plates if the work be carried out at once. With this opinion we entirely agree, and Mr. Newton must excuse us if we say that his words decidedly point towards our reading of the directions. He says, at page 317, "pour the pyro. *back into the bottle,* as it can be used for *any number of plates*, its developing power not being exhausted by repeated using." The italics are ours, and we certainly think the words italicised lead to the view we took. We take this opportunity, however, of setting the matter right. As regards the remarks of the correspondent mentioned by Mr. Newton, we can scarcely think he has even tried the process. It is now well known that chloride exercises a much less powerful effect than bromide in emulsions, and it has also been shown by Mr. Stillman and others that, if an emulsion be once sensitised with silver in excess, an excess of soluble bromide may be afterwards added without destroying the sensitiveness of the emulsion. These are just the conditions under which Mr. Newton works, only that he uses an excess of a less powerful restrainer than the bromide.

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A letter from Mr. Duncan Dallas which appeared in our columns a fortnight ago has, we know, been perused with much interest. In that communication Mr. Dallas claims to have solved a problem of great public value, namely, the printing of photographs by a typographic press and when surrounded by ordinary printing types. Now in this method of "Dallastint"—by which title the inventor has designated his process—we have something calculated to prove eminently useful, *provided* it accomplishes all that is claimed for it. But the fact must not be lost sight of that there are at the present time in existence—although in inactive existence we grant—several processes all professing to accomplish that which the Dallastint now claims to do, not a few of these processes having been patented. No one knows better than Mr. Dallas that our own pages have, in the days of the Paul Pretsch establishment, been more than once illustrated by photographs printed from a typographic or raised surface, the printing having been effected in the ordinary course of machine printing by which this Journal is produced. That one or other of the various methods of producing surface-blocks from photographs has not come into general use arises, not so much from the want of a process, as of a firm or individual who will devote the requisite time to bringing into commercial existence a process of this character. Greater perfection in the way of what we may term "tint-printing" in the typographic press can scarcely be desired than the choice productions of Placet, some of whose work in this direction we have had in our possession for years. Although full working details have been published, we are not aware of a single firm in this country using the Placet process, the beauty of the results of which was such as to elicit the highest encomiums from some "experts" who were present at the recent trial at Kingston Assizes when Banks's patent was before the court, and to which we brought those and similar works to show that some modern patentees had been forestalled by those of past years. We do not mention this for the purpose of detracting from any merit due to Mr. Dallas, who will probably work his process for some time as a secret one; but merely to put on record the fact that the printing of photographs from surface-blocks is already *un fait accompli.* Of the comparative merits of the most recent of these processes we are, meanwhile, unable to speak, not yet having had an opportunity of examining a Dallastint. The thanks of the public are due to all who, like Mr. Dallas and numerous others, are engaged in working out an easy and efficient method of utilising photographs in the production of blocks for printing in conjunction with ordinary letterpress.

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## PRACTICAL INSTRUCTIONS IN THE BEST METHOD OF ENLARGING NEGATIVES.

The production of large negatives from small ones has, during the last few years, assumed considerable importance, owing not only to the great improvement made in the ordinary methods of work, but also to the introduction of what are practically new processes. It is not to be denied that the advertisements of secret processes have had something to do with this improvement. They have been good of their sort, be that new or old; but photographers have tried for themselves, and with the usual result—the obtaining of extra skill in well-known processes, so that now one finds a dozen men capable of producing a decent enlargement for every one to be found a few years ago.

There are, broadly speaking, three distinct methods of enlarging, each of them being subdivided into numerous smaller groups. They are the wet collodion process, a "dry" process, and the carbon process. As I believe working details sufficient for anyone new to carbon printing have never been published, I intend, after briefly alluding to the two former, to give the results of my own working with the latter, which, after much experience, I unhesitatingly pronounce to be the best in technical merit and in practical usefulness.

With wet collodion in the camera, a very beautiful enlarged negative may be produced through the medium of a transparency also made by the wet process. It is essential that the latter be well

exposed, so as to be particularly full of detail, and not too dense. As with some dense negatives a long exposure is necessitated these requirements will not be obtained without modification of the chemicals. The plate should be redipped in a second bath of about twenty grains to the ounce; it will then not develope too dense, if even it should have dried very much. But, beautiful as these results are, there are always two glaring defects accompanying them—firstly, a certain sort of uneven granularity; and, secondly, when a dark and a light body are in immediate juxtaposition a disagreeable fringe of light round the edge of the dark portion. A peculiar flatness so often accompanying enlargements is more owing to the transparency being wrong than to any inherent defect in the process employed. The fringe cannot be got rid of; it is owing partly to the lens and partly to the action of light spread through the particles of the film. The granularity is owing partly to the structure of the *collodion* and partly to the enlargement of minute defects, such as pinholes and specks of foreign matter, both of which are invisible in the negative. It is heresy on my part to utter such a statement as this latter; but I am prepared to make it good. The universal explanation is the coarseness of the particles of reduced silver in the original negative magnified to an extent that renders them too visible. It is understood I am speaking of portrait or landscape enlargements (not microscopic), the usual extent being from two to twenty diameters, and rarely the latter, as a full-length *carte-de-visite* figure made life-size would not need a greater amount of enlarging, and that is almost the utmost we are likely to be called upon to execute in the ordinary way of business. Now, I challenge any one to show a negative—even done by the rawest novice—the particles of silver upon which, when enlarged twenty diameters, will be in the slightest degree visible when printed upon paper such as is used for enlargements, or, indeed, upon any paper.

With regard to dry plates, excellent results are obtained by them, some of the defects being much reduced in extent through not being magnified by two operations; but the making of good dry plates requires much practice to get certain and uniform results—more, in fact, than a photographer with a large business who has not practised dry-plate work is likely to be able to find time for. Of course dry plates can be bought; but, besides the great comparative expense as between wet and dry plates, photographers entertain a rooted dislike to having to depend on others for the basis of their good work beyond such elementary preparations as albumenised paper, &c.

One is scarcely in court in discussing the mérits of secret processes; but what I have just said will, I think, meet the case of two leading advertised processes, which are generally understood to be—the one a perfected method of enlarging from a dry-plate transparency by contact; and the other the production of the enlarged negative from a transparency larger than itself by the wet process, and worked upon by the artist before copying. The time required in the enlarging is a serious objection to this latter process, as with one camera one picture only can be in progress at once; and a large transparency requires much longer exposure than one taken but little larger than the negative.

I now come to the carbon process, which for beauty of results as much surpasses the others as it does in economy of time and simplicity of manipulation. The peculiarity of this process is the transparency, which is printed in the printing-frame in as simple a manner as a silver print, and then enlarged from in the usual manner in the camera by the ordinary wet process. Transparencies produced in this manner are very beautiful to look at—not, perhaps, possessing the velvety depth and richness of colour that a wet collodion transparency has, but having to an exalted degree the qualifications requisite for producing a successful enlargement, viz., great fulness of detail and general distribution of tones, combined with sharpness and the right amount of depth. The manner of production of carbon prints has been explained so often that it is really not necessary to repeat it; yet I will do so in the briefest manner possible that this article may be complete in itself, and prevent the necessity of anyone who wishes to try the process having to refer to back instructions, and that it may show in the readiest way the difference between the treatment required to produce transparencies and ordinary prints by the autotype process.

*The Tissue.*—Special transparency tissue must be asked for. It has an extra thick coat of pigment, the ordinary tissue not giving transparencies of nearly sufficient density, and being very difficult to develope when printed very deep.

*Sensitising Solution.*—Bichromate of potash *(pure)* one and a-half ounce to a pint of water. This will serve over and over again, but in time is apt to work unevenly, and, as it is cheap, it is better to throw it away after it has been used a dozen times or so.

*To Sensitise.*—Thoroughly immerse the tissue for a very short time—not more than three or four seconds in summer and six in winter—and hang up to dry, in the dark, in a cool, dry place. (This is the first departure from the ordinary autotype process for paper prints, in which the tissue may be immersed from a minute to a minute and a-half.) When wet it is scarcely, if at all, sensitive; but, when dry, it is far more so than albumenised paper. It must not be exposed to dark-room fumes, for it would then print foggy and work very insoluble. If the room be too warm the pigment will all run off when hung up to dry, and be found next day in a heap on the floor. Sixty degrees Fah. is the maximum temperature the room should attain. The sensitised tissue, when dry, must at once be put into an air-tight case in a cool place. It will then work well for three or, at the outside, four days. The negative should first have lightly pasted to it slips of tissue paper, leaving just as much of the negative showing as will be required to be printed from.

*Printing.*—The tissue is cut to size and placed in the frame in the ordinary manner, just as with albumenised paper; but very great pressure must be applied to ensure intimate contact over the whole surface. The ordinary small *carte* printing-frames are useless. The necessity of this is obvious. If patent plate be used for the negatives, and the frame be a screw pressure or a strong-springed one containing a piece of plate glass for the negatives to rest upon, not the slightest fear need be entertained as to its safety so long as there is nothing between the negative and the plate glass; the frame might be walked upon and the negative would not break. The frame filled in and exposed to light in the usual way now brings us to the only part that can be supposed to be difficult—the exposure; but very little practice will make perfect here. If a silver print from another negative be printed at the same time, to act as a "pilot," and be turned down the same time as the carbon, there is never any fear of failure. If the latter be wrongly exposed a reference to its depth and that of the pilot will at once indicate the right exposure for the next time, and tell what extent the pilot, put out with fresh paper, must be printed before concluding the carbon print is done. Actinometers are not at all needed; I think they are the greatest bugbears of all to intending carbon printers. Again: carbon printing allows such a range of exposure, particularly with the special tissue, that it is next to impossible to go wrong.

*Developing.*—Each print, which it is understood is quite invisible at this stage, is immersed in very clear, cold water for about half-a-minute, and with it a prepared piece of glass (see later paragraph), which should lie next to the black or pigment side of the tissue. Drawing glass and print out together, the latter uppermost, and avoiding the introduction of air-bubbles, the print must be pressed close to the glass so as to expel all superfluous moisture and any air-bubbles which may have formed. This is best done by the squeegee—a piece of india-rubber stuck between two plain pieces of wood, and left projecting for about a quarter of an inch; but in the absence of this utensil a small sponge answers very well. This is generally called "mounting." After the prints have been mounted for about a quarter of an hour or more they are ready to develope. They are placed in water in which the hand can just comfortably be borne, and allowed to soak for a few minutes. The paper of the tissue will then be found quite loose, and may be withdrawn, leaving a thick layer of black upon the glass. The print, which now looks like a thick coat of black paint without a trace of a picture, must be gently laved with the hot water, when it will begin to show itself. After a little more pouring of the water upon it the qualities of the print will be perceptible. If too light nothing can be done; if too dark it can be remedied by "boiling" the print, as carbon printers call it, which consists in pouring water more or less hot upon the print till it is of the right depth. This, of course, may not be done to extremes, but is quite legitimate if the print be only a little too dark.

The nearly-developed picture, whether printed just the right depth or so deep as to require boiling, should be continually laved with the developing water till at last it is seen that there is no soluble matter left upon it. It may then be transferred to a dish of clean, cold water, well rinsed, and finally steeped for a minute or two in a solution of alum, about an ounce to the pint, for the purpose of making the print insoluble.

The character of the tissue will be at once made apparent when developing. If it seem to dissolve away very readily when put into the hot bath it is in good working order; if it show very great reluctance to dissolve, or refuse to do so at all, the tissue is too old or is otherwise defective, and should be rejected. I have, on a former occasion, recommended the ready-sensitised tissue of the Company; but they do not send out ready sensitised the special tissue for transparencies, owing to its short keeping properties.

When the finished picture is examined while still wet it will have a very unsatisfactory appearance, the thickness of the gelatine composing it obscuring much of the sharpness that it will ultimately show when dry. The drying must be spontaneous. The developed pictures may be put upon a rack just like negatives, but on no account exposed to the heat of a fire to hasten the drying, or they will inevitably be ruined.

*Preparation of the Glass.*—This is in my experience a *sine quâ non;* for if plain glass be used it is next to impossible to get the film to adhere during the whole of the development, and yet, to the best of my belief, the method, or the necessity for it, has never been made public before. The process simply consists in coating the plate with gelatine rendered insoluble by chrome alum; it is more quickly done by immersing the whole plate in the solution. A number can be prepared at once, and, when quite dry, stored away for future use. The solution is made by dissolving by hot water sufficient gelatine to give a perceptible body to the water, and then, while hot, adding a few grains (about one-fiftieth of the weight of the gelatine used) of chrome alum. Gelatine varies so much in substance that it is difficult to give exact proportions, but from a quarter to half-an-ounce to the pint may be used. Too much gelatine will do no harm; too little would not answer the required purpose.

The difference between plain and prepared glass in working is most striking; with the former blisters are sure to occur, which, before the end of the developing, break and tear away. The film washes off at the edges, and there will generally be a few inches only of picture left at the end of the development. With the prepared glass the film is as adherent at the end as at the beginning of the process if the making of a "safe-edge" (as the tissue-paper on the negative is called) have not been neglected. A secondary plan—not so efficient, but still a useful one when the gelatined plate is not at hand—of preparing the glass is to coat it with collodion and then well wash it before mounting the tissue. The adhesion is not so complete as with the gelatine and chrome alum, and the whole print is apt to float away bodily; still it is far superior to plain glass.

The defects likely to occur are not many. I will endeavour to name them and their remedy.

*Tissue will not Adhere when Mounting.—Cause:* Too long soaking before mounting; as soon as the curl of the print has gone down it is time to mount. If too long a time be allowed to elapse the print is of no use and may be thrown away. It is generally at the edges and corners where the refusal to adhere first shows itself. If the print be much over-printed, or have been exposed over the whole of its surface to light for any length of time, it will be difficult to make it adhere.

*Blisters.*—Either the coating of gelatine on the plate is too thin, or small particles of foreign matter have got enclosed between the tissue and the glass, or the tissue itself has a small lump of insoluble matter at the spot.

*Picture will not Develope.*—Tissue kept too long, or exposed to light, or prepared among dark-room vapours, or when the products of burning gas are in the atmosphere; all these causes make it insoluble.

*Patchy Appearance of the Transparency—some Parts Bright, others Dim and Pale.—Cause:* Too short a time in the sensitising bath. This, however, is less likely to occur than the following annoying defect.

*A Peculiar Granulation Over the Whole Print.—Cause:* Too long a time in the sensitising bath. This is a very annoying and a very frequent defect unless special precautions be taken. In hot weather it is very prevalent, and may be partly provided against by keeping the bath as cool as possible and performing the sensitising in a cool place. If ice be at all handy a small piece put in will be the most likely means of all of preventing the occurrence. The probable cause of the appearance is that the gelatine of the tissue melts, and thus the pigment separates into fine clots.

*Running of the Tissue.*—This has been already explained—too high a temperature in the drying room, or too long immersion of the tissue in the sensitising bath. It will sometimes run in patches without dropping off. The effect and its remedy will be discovered by simple inspection of the dried tissue.

I now come to the defect peculiar to this process under present conditions. I have never been able to come across a piece of the tissue which did not in the transparencies give a number of minute black specks, scarcely, if at all, visible with the naked eye, but showing very strongly in the enlarged negative in the form of pinholes of all dimensions. Most of these do not show in the print, owing to the fact that black specs on a light ground look smaller than they are, and white specks on a dark ground larger than they are; thus a double diminution of their apparent size takes place. Still they are present in sufficient quantity to become a decided defect; but it is to be hoped that, ultimately, the manufacturers may be able to remedy it. The most feasible way to me appears to be to abandon the use of the indian-ink, which is the black basis of the pigment of the tissue, and to substitute something in the nature of a dye rather than a pigment. For the particular purpose in question a dye would answer as well as a pigment.

I have tried to make this paper as complete as possible; but if any should try the process and fail I should be glad to render assistance through the medium of THE BRITISH JOURNAL OF PHOTOGRAPHY. But the matter is so simple that failures are next to impossible.

In conclusion: I earnestly recommend all interested in enlarging to give the process a trial. I feel sure it would be almost universally adopted. G. WATMOUGH WEBSTER, F.C.S.

## HOW TO STRENGTHEN AND IMPROVE WEAK NEGATIVES.

THERE appears to be a great deal of speculation, uncertainty, and vexation concerning the validity of M. Lambert's patent, and I propose, with your kind permission, to describe a very simple method of producing effects and results similar to those obtained by M. Lambert's process without infringing, or hazarding the infringement of, the patent rights in the slightest degree.

The process I am about to describe is not a recent conception. I have employed it for strengthening weak negatives for some time past, and have shown it to friends visiting my studio. It is one of many ways to "help a lame dog over the stile," and of enabling me to make a passable print from a miserably-thin negative, such as is generally obtained from children and animals on account of under-exposure.

There are two ways of doing it. The first and *most mechanical* is to apply a *strengthening plaster* to the back of a *weak negative* in the following manner:—Take a collodion transparency or a paper print from the weak negative; fix, wash, and dry it. From that take another print, which will be a negative, fix and wash it in *boiling* water, and, while wet, apply it to the back of the negative. Adjust it carefully, and with the finger press out all air and water so as to secure absolute contact. When dry, make it transparent by smearing it with castor oil or by removing the paper by wetting and rubbing. The latter plan is the better one, but it involves most trouble.

The second is the more *artistic* method, and most resembles M. Lambert's process. It is as follows:—Fix in hyposulphite of soda, without exposing to light, a piece of sensitive albumenised paper; wash it in boiling water, and lay it on the back of the negative while wet; secure absolute contact by rubbing with the finger or squeegee. When dry rub off the paper, leaving the unbroken and undisturbed film of albumen on the glass. This has a ground-glass appearance, a *stronger tooth* than ground-glass varnish, and can be worked upon with the stump and plumbago so as to increase density and heighten effects. Attach to the front a piece of tracing or thin paper on which to do the *sharp* retouching, spotting, &c. M. Lambert's patent is thus evaded; for there is an albumen film on one side and a paper screen on the other, on which the same artistic effects can be produced by working on both sides of the negative.

Now that I have described a method of avoiding all the pains and penalties of patent-right infringement I hope that your discontented readers will rest satisfied, and make the most they can of a process obtained without cost.

At the same time I think it is but fair towards M. Lambert to stats that it is utterly impossible for me to impart a tithe of the dexterity and ingenuity which that gentleman exhibits in his manipulations. I have seen M. Lambert *at work*, and I do not hesitate to say that it was absolutely impossible for him to cover in a specification the real strength of his process. The placing of the papers on both sides of his negative is only a step towards the accomplishment of the objects desired; and the finished results obtained by that and the subsequent operations are not, I believe, to be attained in any other way.

The real value of M. Lambert's patent lies not in his specification, but in the quick and certain manner in which he imparts to his licensees the sure and never-failing method of securing the most satisfactory results in the shortest possible time and with the minimum expenditure not only of time but *matériel.* The certainty with which he reproduces and improves negatives is surprising, and the acquirement of that information alone—to say nothing of the numerous other technical instructions included in his demonstrations—is well worth the money he asks for a license, which enables and empowers a licensee to practise with certainty and without molestation the Lambertype, chromotype, and all the operations of autotype or carbon printing.

It is scarcely possible for any man to entertain a greater contempt for *petite patentes* than I do; but when a stranger who has valuable information to impart and dexterity of manipulation to exhibit, whether protected by the patent laws or not, comes amongst us I think he should be received with courtesy and consideration. Knowing that M. Lambert's process and instructions will be valuable to every photographer, I wish him well and many followers.

J. Werge.

## HOW TO MAKE EMULSIONS.

Having published the result of my experiments with bromide emulsions I am receiving numerous applications for a definite description of my mode of working the formula which I have adopted. Those who are familiar with emulsion work would require nothing more than has been published; but there are many who have never tried an emulsion, and yet are desirous of being in possession of a simple and reliable dry-plate process. This class have heretofore been deterred from making dry plates by the apparent amount of labour necessary, the complex formulæ, and uncertainty of results. A number of this class have indicated a purpose to give my emulsion a trial, mainly on account of the facility with which it is prepared and used. For the benefit, therefore, of such I will give as briefly as possible all I deem necessary to enable anyone so disposed to use it.

The first thing to be done is to make a suitable collodion. For ten ounces of collodion use alcohol four ounces, and ether six ounces; dissolve in the alcohol 120 grains of bromide of cadmium (I have found no bromide equal to cadmium for this purpose); then put into the salted alcohol ninety grains of papyroxyline, which I procured from E. and H. T. Anthony and Co., the manufacturers. This is much superior to any of the cottons I have used, flowing more evenly without having to give a long time to ripen. After the cotton has become thoroughly saturated with the alcohol add the ether and shake well. To prepare the bromide I take an ounce, place it in a small evaporating dish over a slow fire, and add half-an-ounce of alcohol, stirring well with a glass rod until it is reduced to a white paste and evaporated to dryness. All the care necessary in this process is to see that there is not heat sufficient to burn the salt. The silver should be fused.

To make the emulsion take three ounces of the above collodion and fifty-four grains of the fused nitrate of silver finely pulverised and placed in a test-tube. Then pour into a graduated glass one ounce of alcohol, pour into the test-tube one-third of this alcohol, and boil by the flame of a spirit lamp until it is saturated with the silver; then pour into the collodion and shake violently for fifteen or twenty seconds; then add half the remaining alcohol to the silver in the tube and proceed as before, continuing this process until the silver is all dissolved and added. The one ounce of alcohol will be sufficient. Adding the silver to the collodion should be done in the dark room, and should be protected from the light, even from that of the spirit lamp. Eight or ten hours after (shaking frequently in the meantime) add twelve grains of chloride of cobalt dissolved in half-an-ounce of alcohol; shake well, and in two days it will be ready for use. If chloride of cobalt be not convenient use chloride of calcium. It is not necessary to add the alcohol containing the silver a little at a time, as is usually recommended; pour all into the test-tube without stopping.

If the emulsion curdle the curd soon dissolves, never remaining more than two hours, but usually not more than fifteen minutes. The plates are prepared with a substratum of albumen. The white of one egg—or if dried albumen be used take ninety grains—should be dissolved in eight ounces of water, then into another eight ounces of water put sixteen drops of carbolic acid. When the albumen is dissolved add the water containing the carbolic acid and shake well. Albumen so prepared will keep indefinitely, and answers the purpose much better than when dissolved with ammonia; in fact, albumen with ammonia cannot be successfully used for an emulsion plate which is to be developed with alkali and pyro.

When your emulsion and plates are ready flow the plates with the emulsion, and when set, the same as required by a collodion plate for the nitrate bath, place it in a dish containing the preservative, which is compounded as follows:—

| | |
|---|---|
| Water | 20 ounces. |
| Tannin | 20 grains. |

Or the following, which gives a more sensitive plate:—

| | |
|---|---|
| Water | 20 ounces. |
| Tincture of nux vomica | 5 drachms. |
| Laudanum | 3 ,, |
| Alcohol | 2 ounces. |

When the tannin is dissolved add three-fourths of an ounce of laudanum, shake well and let stand half an hour; then filter out the flocculent mass and it is ready for use. This preservative will keep indefinitely, occasional filtering only being necessary.

As soon as the greasy lines are off the plate can be removed, the back wiped with a sponge or damp cloth to facilitate the drying, and then stood on corner on blotting-paper. It should not be set square down on the end, as the accumulation of the preservative there will keep it wet for a long time and injure that part of the plate. Prepared in this way the plates can be used before drying if required, although they are not quite as sensitive as when dry.

To develope I prepare two bottles of ammonia and water in this way:—Water three-fourths of an ounce, ammonia one-fourth of an ounce; into one vial I put five grains and into the other fifteen grains of bromide ammonia. If the exposure have been too long I use from the bottle containing the fifteen grains of bromide, or mix them as occasion requires. Second: make a six-grain solution of pyro. in water. To develope an 8 × 10 plate, place in a wide-mouthed vial half-an-ounce of the pyro. solution and half-an-ounce of water. After the plate has been well washed flow with this solution. If the picture come out immediately the solution is of the proper strength; if, however, the image do not come out increase the strength of the pyro. solution. When the details of the picture are visible, which should result in about a minute and a-half, pour off the solution into a vial containing six drops of the ammonia solution and again flow the plate. The intensity commences immediately, and goes on rapidly until sufficient strength is obtained. Wash and fix in hypo. or cyanide. If, after fixing, the negative should prove too thin any degree of strength can be obtained as follows:—Make a strong solution of iodine in water containing iodide of ammonia, and into three ounces of this put half-an-ounce of hydrochloric acid. Into a vial containing sufficient water to flow the plate well put enough of the iodine solution to give it a good orange colour; flow the plate with this solution for say half-a-minute, or until a slight veil appears by reflected light; then wash and flow with a solution of pyro. and tannin six grains each, acidified with acetic acid; then pour off into a vial containing ten drops of a plain twenty-grain silver solution, and again flow the plate. The proportions of pyro. and silver can be varied as the case may require. If the picture lack detail use less silver and a stronger pyro. solution, and the reverse where there has been over-exposure.

There seems much in the above which has already been published, and therefore superfluous; but my apology is the fact that I have had repeated applications for the process in this form, and have in several instances been compelled to write it out. And, further, in my experience I have found some modification of former statements necessary. For instance, when I say the chloride can as well be added dry instead of dissolved in alcohol, I find it is much better to add it in solution as given above. Plates prepared with this emulsion require no backing, as they are very opaque when dry.

I have no special pleading to make in favour of this process as compared with any other; whether A., B., or C. try it or not is of the utmost indifference to me. I am not working in this matter for either fame or money. If I succeed in helping any of my fellow-photographers to produce superior negatives at a minimum outlay of labour and money I shall feel fully compensated for the little trouble it has cost me in working and experimenting. This kind of work is to me a pleasure for which I ask no other compensation; therefore adverse notice or criticism is of no account to me, any further than it may affect those I am trying to benefit. Occupying, as I do, this position, I feel called upon to notice briefly some remarks of the London correspondent of the *Photographic Times*, in the July number, on my first article on emulsions, as it has come to my knowledge that several who were disposed to try the process have hesitated to do so after reading the notice alluded to.

When this correspondent states that the accumulation of chloride in the preservative will, to a certain extent, destroy the sensitiveness of the film he evidently draws his conclusions from his *theory*, advanced in the first paragraph of his letter, that the action of a chloride and a bromide are equivalent, which is *not* a fact. I am hardly willing to believe so intelligent and experienced a writer to be ignorant of this. Suppose, however, that a large quantity of soluble chloride in the preservative would, to a limited extent, produce the effect he claims, what do the figures reveal? We will take eight ounces of emulsion for thirty plates 8 × 10. In this eight ounces we have, in the first place, twenty-four grains of silver in excess. To take this up we add thirty-two grains of chloride of cobalt; about eight grains of the chloride will be used, leaving in the eight ounces about twenty-four grains of chloride in solution. The preservative

consists of water twenty ounces, alcohol two ounces, laudanum six drachms, tannin twenty grains, making in all twenty-three ounces; for convenience we will call it twenty-four ounces. We will have to do only with the last of the thirty plates, and will suppose that all the twenty-four grains of chloride have been washed out of the emulsion and held now by the preservative. This would, if true, give one grain of chloride to the ounce of preservative. The plate, when taken from the preservative, retains less than half-a-drachm of the solution; we will, however, call it half-a-drachm for the purpose of illustrating the absurdity of the claim of the said correspondent. This will give to the *last plate* one-sixteenth of a grain of chloride, which is to be distributed over eighty square inches of surface. This will give $\frac{1}{1280}$ths of a grain to the square inch.

Comment on these figures is unnecessary, and it will be exceedingly difficult for any intelligent reader to believe that the *Photographic Times*' correspondent seriously entertained the views he has written on this subject. I have added as many as twelve grains of chloride to the ounce of emulsion without perceptibly affecting its sensitiveness. As I stated in my first paper, I have tried most of the published formulæ for making emulsions. I have washed them and dried them, and therefore know something of the amount of labour involved by the different processes, and have no hesitation in saying that this is the most simple, uniform, and satisfactory in its results of any I have ever tried. H. J. Newton.

## NOTES ON PASSING EVENTS.

By a Peripatetic Photographer.

Before the subject of the Wothlytype process again ceases to engage public attention it would be gratifying to learn how two such well-known assertors of the superiority of the process—as giving "exquisitely beautiful results," "permanent results," and soforth—as Colonel Wortley and Mr. Faulkner came to discontinue its use. Frankly, now, was it not because they obtained equally "beautiful" and "permanent" results by other and simpler methods? No photographer who values his reputation, and who desires to present to his clients the very best work, would venture to discontinue using a process possessing such exceptional advantages as those claimed for the Wothlytype process, simply because of any mechanical inconveniences in the way of carrying it out. Not for a moment, however, would I wish it to be imagined that there are either difficulties or inconveniences associated with it, for on this point the authority of nearly every writer might be quoted contrariwise. To what cause, then, was due the demise of the Wothlytype process? Colonel Wortley and others, it is true, obtained a patent for it; but that patent expired long ago, and no obstruction of a legal nature now interposes. Why, then, has this process fallen into a state of desuetude?

Observing that in his articles upon the photo-relievo process Mr. Winstanley recommends talc as a medium on which to spread the bichromated gelatine, I believe I speak within bounds when I say that this substratum is not now used by those who practise the Woodbury process, having been entirely supplanted by collodion, which is, in these articles, only recommended as an alternative. But *cui bono* describing in detail a process which no one in this country, one firm alone excepted, is said to have any legal right to practise? Probably Mr. Winstanley is not aware that a lawsuit on a somewhat important scale is pending to decide the rights of a firm other than that holding Swan's patent (Woodbury's patent lapsed some time back) to use the Woodbury process. Till this point is settled it is problematical whether it is wise that working directions be given for doing that which may bring trouble to the unfortunate individual who tries to put them into practice. I, of course, here abstain from giving any opinion as to the right of any firm to the exclusive use of the Woodbury process.

The retouching of landscape negatives has been recommended at a meeting of the Liverpool Amateur Photographic Association. This is a subject which deserves far more prominence than it has received. It is not so easy to obtain a perfect landscape negative as a portrait one, for in the latter case the lighting, posing, and dressing are matters under control; but not so with the landscape. The houses may be very white, and their roofs may shine with a metallic lustre in the very same picture in which the grass is very dark, the trees very brown and sombre, and the cows and other live stock frolicsome to an unbearable or, at any rate, unphotographic extent. Especially is the dark foreground of a grassy subject a sad drawback to pictorial harmony; and were landscape retouching more practised than it is the art-department of our compound science would stand higher. But moralising is not my forte; hence I close this paragraph by stating in what way I saw a very faulty negative, which gave sombre-looking trees and heavy, black foreground, improved to an extent truly surprising. It was, first of all, re-varnished with a plain alcoholic solution of sandarac and castor oil, by which means an ordinary blacklead pencil was enabled to bite the surface with facility. A brush charged with strong gum water was next run round the margin of the back of the negative, and a thin sheet of paper, previously rendered translucent with paraffine, was then made moist and cemented to the back by means of the margin of gum. This was now placed against a strong light and worked over here and there, as found necessary, by a crayon stump charged with powdered graphite. A few sharp touches were next given with a pencil to the face of the negative, which thus became converted from an exceedingly commonplace negative to one from which several admirable pictures have since been obtained.

The stains caused by pyrogallic acid, when used as an alkaline developer, are proverbially difficult of removal. They seem to set cyanide of potassium at defiance, even though the solvent powers of the cyanide be increased by the addition of iodine. Mr. Berkeley, if I am right in my reading, will not find tartaric acid remove such stains, but they yield at once to iodide of nitrogen. This, if I mistake not, is one of Mr. M. Carey Lea's discoveries. I have never tried this remedy for stains, nor have I any immediate intention of doing so; for, simple though the operation of making the ter-iodide of nitrogen be, and it is difficult to conceive of anything much simpler, the partition is so very thin which separates the successful making of the solvent for the pyrogallic stains and the deadly compound which explodes by a touch—nay, by a whiff of air or a drop of water—that I have hitherto preferred to give it the "cold shoulder," and endure the nigrescent stains on my fingers rather than run the risk of being forcibly expelled through the window or roof of my *atelier*. It ought to be known that a sudden plunge of a stained finger into nitric acid, followed by an equally rapid transference of the digit to warm water, will remove the most inveterate silver stain at the trifling expense of the yellowness produced by the acid, but which takes its departure in a short time.

It is gratifying to find light at last thrown upon the oft-alleged and as oft-denied accelerating agency of methylic alcohol in the developer. Mr. Warnerke's experiments, described in the Journal of the 16th ult., are so clear and so eminently satisfactory that I am tempted to suggest him as the man of all others qualified to tackle the subject of *Uranium in the Bath*, and try to ascertain if in any sense the addition may be considered beneficial.

It must have afforded a high degree of gratification to every reader of the Journal to have had presented the outline of the personal history and public doings of a man so much esteemed as Major Russell. While reading your otherwise excellent memoir of this gentleman I noted one point that had been overlooked, viz., his application of nitric acid to a negative obtained on a bromised plate so as to convert such negative into a positive by one operation. The principle involved in this is beautiful and its practice delightful. After the picture has been developed by the alkaline method it will be found upon examination that the image is composed of silver which has been abstracted from the film itself—a conversion of the bromide of silver in the film to the metallic silver of the image. Now, as nitric acid dissolves metallic silver but has no action on the bromide of this metal, it follows that the application of this solvent to the film will clear away all the reduced silver and leave the film transparent in the exact ratio of the previous opacity of any one part. Hence, instead of the negative that was the direct result of the development, we have now a transparency in which the tones range from the unaltered bromide of silver to clear glass. As the transparency thus obtained is somewhat feeble, any desired degree of intensity may be imparted by exposure to the light and subsequent application of a developing or intensifying solution.

I observe that there is to be no convention of American photographers this year. Has the novelty of an annual meeting worn off so soon that such decision has already been arrived at by the executive?

*Apropos* of the forthcoming meeting of the British Association in Bristol, I suppose, judging from recent experience in other localities, there will be no use anticipating anything photographic from the local scientists in that quarter. Keeping in mind what has been said and written concerning spirit photography in Clifton a short paper, by some one of the Clifton gentlemen who were present, *On Certain*

*Abnormal Visible Phenomena on Collodionised Surfaces* would create a sensation, and be the means of causing the attention of the members of the British Association to be earnestly directed to the subject. It is worth trying.

## A CONVENIENT LEVELLING STAND.

A LEVELLING stand is frequently very useful for developing dry plates, preparing gelatine films, and many other purposes. I send you a description of one that I have used for some time and find to answer the purpose well.

The whole affair consists of three screwed wire eyes, such as are used for hanging up pictures. In using them they are simply screwed into a piece of board, about four or six inches square, at a convenient distance for the size of the plate to be worked; or if the bench or table at which I am working is not much worth I screw them directly into it. They can be put at any distance, so as to be used for plates of the very largest size; no hole need be bored for them, as they go easily into soft wood with merely screwing them in.

This form of stand has at least two merits—that of portability, for the materials for the stand can be carried in the waistcoat pocket, and are handy for developing dry plates when away from home. It has also the merit of cheapness, the screws for two stands (one set of which I send you) costing only three-halfpence.

It, of course, requires a spirit-level to set the plate perfectly level; but, when I use the stand for development only, I generally dispense with the level. I pour some water on the plate and observe which is the lowest corner, and turn the screw at that side up a little till none runs off. Practically this answers all that is required.

J. M. TURNBULL.

## FOREIGN NOTES AND NEWS.

THE BERLIN PHOTOGRAPHIC SOCIETY.—RETURN OF DR. VOGEL.—UNBREAKABLE NEGATIVES.—THE PREVENTION OF BLISTERS IN DRY PLATES.—THE ACTION OF LIGHT UPON EBONITE.—THE EFFECT OF LIGHT ON THE RETINA.—NEW APPARATUS.

A SAN FRANCISCO photographer has lately "interviewed" the King of the Sandwich Islands, and sent his portrait, and that of his principal minister, to the Berlin Photographic Society.

At a recent meeting of this Society Herr Brückhan showed a rotary burnisher constructed by himself on the same principle as Weston's. The latter is not protected by patent in Germany, so Herr Brückhan has infringed none of its rights.

A committee was appointed to consider the advisability of organising a widows' and children's fund.

The gentlemen who had undertaken to test Mayr and Fessler's retouching-paper reported very favourably of it. One of their number recommended the use of collodion instead of gum for fastening the paper to the negative.

At a subsequent meeting of the same Society—the last of the season—the presidential desk was decked with bouquets and garlands to welcome Dr. Vogel on his resuming the chairmanship of the Society after his long absence from Berlin. On Dr. Vogel's entrance he was greeted with three cheers. He then thanked his co-members for the kind reception they had accorded to him, and gave an interesting account of his journey.

Mr. Seibert, of Washington, a member of the American Expedition to Japan for the observation of the transit of Venus, was then introduced to the meeting, and showed a large collection of Bourne and Shepherd's beautiful Indian views, which were duly admired by all present.

The usual three months' holidays were then agreed to, though it was intimated that there might possibly be some extra meetings called. The meeting then broke up, and the rest of the evening was agreeably passed at a banquet in honour of the President's return.

The following note upon the damage sustained by negatives by the breaking of the glass is from the *Photographische Mittheilungen* for July:—"Every landscape photographer will have lost some negative or other by breakage in transit, the most careful packing being of little avail if the packages have far to go or have to pass a frontier line. Even a package containing a dozen Wortley plates packed in a box by themselves came to hand broken. So we have thought it desirable to call attention again to the old method of removing the negative which might easily be resorted to by a landscape photographer who remains long in one place. We saw this process employed with good results in Capri by Fraulein Emma Plauck. She coated the finished but unvarnished negative with a gelatine solution of 1 : 10, placed it horizontally to dry, which it did in about two days, and then drew it off and forthwith used the glass plate anew. In this manner she has produced hundreds of unbreakable negatives, and economised greatly in the matter of glass plates."

In the course of a discussion at a recent meeting of the Photographic Society of France, on the subject of blistering and slipping of the films in dry plates, M. Davanne alluded to the report of MM. Fortier and Chardon on the use of powdered talc for the purpose of preventing such defects. The method employed is, after clearing the glass in the usual way, to polish it with a piece of chamois leather dipped in finely-powdered talc. After such treatment the adhesion of the collodion to the glass is perfect, and neither slipping nor blistering of the film is to be feared. Curiously enough the same treatment facilitates the removal of collodion films from glass, as in making pellicular negatives. M. Geymet thought that the adhesion of the collodion film under such circumstances was due to the homogeneous nature of the glass surface, and stated that if the glass be washed before coating with a mixture of alcohol and ammonia, so as to remove all greasy matter, a similar result is obtained.

In the *Bulletin* M. l'Abbé Laborde notes the fact that ebonite, amongst other substances of a non-photographic nature, is easily acted upon by light. If a piece of the material in question be partially covered with an opaque substance, and exposed for some hours to full sunshine, the portions acted upon will be found to have acquired a more or less dull appearance, the black colour being much less brilliant than the portion not acted upon. This effect M. Laborde ascribes to the presence of sulphur, and remarks that if it be desired to retain the brilliant appearance of ebonite articles it is advisable to protect them from powerful light.

The same gentleman also draws attention to a curious effect produced by light upon the retina. If a negative be held at the distance of distinct vision between the eyes and a strong light, the attention being fixed upon a given point, for about half-a-minute, it will be found that upon turning the eyes on to a sheet of paper at the ordinary distance of vision a positive impression of the negative is visible. This image is not very distinct and disappears quickly, but may be made to reappear by opening and shutting the eyes rapidly. By placing the sheet of paper nearer to or further away, the phantom image becomes smaller or larger in proportion. M. l'Abbé Laborde deduces from this that the retina plays the part of a sensitive film and is capable of retaining for a certain length of time the impressions which fall upon it.

Outdoor photography appears to be on the increase in France and Belgium, if we may judge by the number of novelties which are continually appearing in the journals. It is but a few months since M. Plucker and Dr. Candeze, both members of the Belgian Photographic Association, turned their attention to the improvement of outdoor apparatus, and the result was the production of the *scénographe*, which has been previously described in our pages. Many other names might be mentioned since that time, the most recent being MM. Geymet and Jonte. The chief novelty in the apparatus of the former gentleman is the manner in which the plates are transferred to the camera without the interposition of a dark slide. After focussing, the plate-box slides directly on to the camera and the plate is dropped into position at once. In order to bring the different plates into position successively the box is fitted with a flexible sliding-shutter similar, we imagine, to the sliding portion of Mr. Hare's new changing-box. M. Jonte's apparatus is merely noticeable on account of its extreme lightness, the whole apparatus complete weighing only 800 grammes (about $1\frac{3}{4}$ lbs.). M. Derogy, the optician, has also recently introduced a new enlarging apparatus, which may be used with solar or artificial light. It is stated that with an ordinary lamp (not oxyhydrogen) an enlargement may be made on wet collodion from a quarter-plate to $30 \times 40$ centimetres (about $15\frac{3}{4} \times 12$ inches) in about one minute.

## OUR CLUB.

### No. IX.—A WEIGHTY SUBJECT.

YOUNG Joseph turned out a regular trump. He took to the trade like a duck to water, and rendered invaluable assistance to Tom, who was daily working away at booked orders. In taking orders I got a considerable way a-head of Tom in his execution of them, so that I got old Peter, not being very busy, to accompany me, and started to take some pictures on chance—that is, where we had not received orders; for I felt convinced in my own mind that, in nine cases out of ten, if they saw the pictures ready finished they would buy, when they would be afraid to place an order right off to have it done.

One morning we pitched our tent at a farm-house, which turned out a little mine of wealth to us. We had fully a week's work—the house, the barn, the orchard, the stack-yard, from the prize bull to the old blind dog, all had to be photographed. Old Peter and I had a regular run of luck that week.

I may as well tell you that Peter was highly delighted with his position and prospects; for I had arranged that he should be our agent when we had left the field, and as he was to have a good commission on all orders he enjoyed the brightening prospect amazingly. On our journey he put me up to a few things likely to prove profitable to both parties.

After we had finished the farmer's orders, and having presented him with some pictures of his family, just to show in a small way that we appreciated his uniform kindness, we took our departure.

We had just started when Peter, turning to me, remarked—"Now we're in this district, sir, there is an old woman quite notorious in these parts which you might make a picture of. It's on our way home."

"In what does her notoriety consist, Peter?" I asked.

"In her size, sir—a regular prize baby for weight. She'll stand twenty-two stone, I should say."

"Indeed! that's a great weight!"

"Yes, sir, folks come from miles round to see her. She is so fat she can't walk. But I think she would sell; don't you?"

"I don't know, I'm sure," I replied; "but we'll drop in and see her, at anyrate."

This lady—of precious stones twenty-two—kept a house of entertainment a little off the public highway, but it was in such a position that it certainly would never have been seen by chance; one had to look for it to find it. I supposed that all her trade was done by selling refreshments to those who came to view the landlady.

We entered what might be termed the "public room," and there we found the lady of the house in a corner; but such a corner!—it meant a third part of the room!

"How are you today, Margaret?" asked Peter, handing me a chair and taking one himself, evidently quite at home.

"Oh, well, Peter, I'm no' that bad, considering my size and this warm weather." She sat in a large arm chair, and her arms hung down by her side; she had a clear, intelligent eye, but her face had lost all expression, it was so fat. Her fourth chin was just beginning to grow; from her mouth down she looked as if she had folded the parts to put them into less compass. She never seemed to move. There was a girl there—her daughter evidently—serving some refreshments in another room, and she came into the apartment where we were seated for the change of half-a-crown. The old lady's pocket was evidently used as the till, but she had not energy enough to go into it herself; for the girl just showed her the money, put it into her pocket, and, taking out the change she wanted, away she went without saying a word. Thus she attended to her own money matters.

After having some refreshments we quietly brought on the subject of picture-taking. After telling her of some of the places we had been at and the success we had had—

"This gentleman would like to take a picture of you, Margaret," Peter said; "a photograph, you know, that you could have copies of and sell to your customers."

"Oh, it's no use trying it, Peter. I was tried once before, and the man could'nt do it; I was so big and so heavy, the fellow said, that my very reflection broke down his machine." Here she burst out laughing, and that was a laugh to be remembered. She swelled and she rolled like the billows of the sea, and the old arm-chair rocked and creaked again.

"I can assure you, lady, my machine is quite safe," I replied, entering into the weighty one's humour; "I had it brass-bound specially for extra-hard work."

"It would just need to be bound with brass or something to contain my size without breaking up. And do you know, sir," she continued, "I've seen the day when I was so thin that I could have run or jumped with the sharpest of them. The first to mount the stack, the first to jump into the cart, was Maggie McPherson; but those days are past. I got married and settled down."

"And you can see how settled I have got," I thought to myself.

The weight of FLESH upon her was greater than she could bear. Peter explained to her my fame as a picture-taker, and showed her some of the copies of the farmer's family, which so delighted her that she consented to have her picture *drawn.*

It was no easy matter to get her conveyed outside her own door; but calling all hands to the work we got her seated outside, her chair placed immediately under her signboard, and managed to get two or three good negatives of her. We again had her placed in her corner, and after lunch we bid farewell to Maggie McPherson, promising to send her a lot of her pictures in a day or two.

That evening, when I was looking through the negatives to see which would be best for printing, Peter said, with a leer in his eyes—"Can you tell me, sir, how many *pounds* you can take out of twenty-two stone?"

This was a joke. I note this in case you might not have observed it. I raised the window and let it escape, and then resumed my work.

MARK OUTE.

## PHOTOGRAPHIC EXHIBITION AT BRUSSELS.

We still labour under the disadvantage of not possessing a catalogue of this the first photographic exhibition that has been held in Brussels, but in which there are so many fine works, and such evident appreciation of them by the visitors, that we are quite safe in saying it will be followed by similar displays periodically.

This exhibition differs from, and is superior in interest to, the London exhibitions—at least in one respect, viz., the presence of a variety of photographic apparatus. It would much conduce to the interest felt by visitors to the London Photographic Society's exhibition—especially those from the provinces—if this feature received a much larger amount of attention, and if manufacturers of apparatus and chemicals were invited to send in their newest productions for public examination.

Continental photographers are admitted to surpass our home artists as regards perfection in retouching of large portraits, and of the various examples of this kind of work four fine direct large pictures by J. Gertinger are deserving of special notice. The retouching is of a very high class. In what may be designated (borrowing for the moment a misused term from the cards of one or two London photographers) "art photography," a number of Rembrandts by Deschamps deserve special commendation for their excellence.

Dernier, of St. Petersburgh, exhibits several works executed in the peculiar style associated with his name. Some of these border on flatness, although otherwise fine examples of photographic portraiture. A collection of artistic gems (Nos. 426 and 427), by Rottmayer, will repay careful examination, as will also four charming studies by Lumiére, of Lyons; in these we commend the admirable expression obtained on the faces of the young chess-players.

Angerer, of Vienna—a man long associated with the production of works of the highest class—is here represented by two very fine groups each about sixteen by twelve inches, and by other portrait studies of equal excellence. Fritz Luckhardt is so well known as a master of his profession that it is only necessary to say he is an exhibitor. Although highly retouched, his exhibits are in every sense gems of art. What we have said of Luckhardt, of Vienna, applies equally to Reutlinger, of Paris.

Cracow is well represented by a series of admirable original photographs and reproductions by Szubert, of that city. A portrait of a child—size of the picture about 20 × 16 inches—which forms the centre piece in a frame containing works by Franz Kosmata, is especially worthy of commendation, notwithstanding the other charming works of this artist, all of which are very excellent.

Gutekunst, of Philadelphia—who, it will be recollected, obtained the Anthony prize for his exquisite pictures of children, *Murillo* and *Adele*—contributes a number of pictures which for brilliancy and *richesse* have never been surpassed. One of the frames containing this artist's work has suffered severely in transit, disclosing the fact that he uses British plate glass of half-an-inch in thickness and of a decidedly green colour to protect his pictures. How much better would they have looked had the glass been a thin, colourless sample!

The portraits (cabinet up to 10 × 8) exhibited by J. Ganz are admirable specimens of manipulation and show great artistic feeling.

Astronomical photography is represented by nineteen photographs of the moon, ranging in size from one inch to twelve inches. No artist's name is attached to them. While they are undoubtedly excellent they would be still better had more care been displayed in the printing. Another artist exhibits four views of the transit of Venus.

There are several fine specimens of photolithography and other modes of reproduction by artists with whose names we are as yet unacquainted. But Goupil and Co. exhibit largely, among their collection being charming specimens both of Woodburytype and photo-engraving.

There is a most important work in carbon (No. 108), by Braun, of Dornach, its dimensions being about seven feet by three feet. It represents the ceiling of the Sixtine Chapel in the Vatican, the picture being in various pieces cleverly joined together. Equally imposing are three large views of iron works in Dusseldorf, taken with wet collodion. No. 369 (one of the three) is exceptionally good, being alike perfect in manipulation and definition.

Levy, of Paris, exhibits a large and choice selection of the albumen lantern slides for the manufacture of which he has attained such celebrity in this country. Mr. York and Mr. Woodbury also exhibit works of this kind which fully sustain the high character of these gentlemen. Among Mr. York's contributions are many slides of the denizens of the Zoological Gardens, Regent's Park. Mr. D. Hedges also exhibits, although on paper, a collection of photographs of various domestic animals.

It is scarcely creditable that in an exhibition so near to the birthplace of photographic enamels there should be so few exhibitors, and still less creditable is it to our French brethren, although highly gratifying to Englishmen, that a London exhibitor of enamels, Mr. A. L. Henderson, occupies a position far in advance of his compeers.

Messrs. Spencer, Sawyer, Bird and Co. exhibit largely, their works being exceedingly fine and effective. Amongst the most noticeable of their pictures are two enlargements, respectively Nos. 22 and 23. The latter of these is a three-quarter figure of a gentleman, nearly life-size, from a negative by Mr. G. W. Wilson, of Aberdeen—certainly the

finest enlargement, without exception, in the exhibition. The former is from a negative (a portrait of a lady) by Mr. Lombardi, of Brighton. This is marked as "untouched." It is a picture which would have been improved by a few touches of the pencil applied to correct a slight halation apparent round some of the darker portions of the picture.

The exhibition is held in a large building at the back of the Theatre Royal Du Park, easily accessible from all parts of the city.

# Correspondence.

## A REGISTERING ACTINOMETER.

*To the* EDITORS.

GENTLEMEN,—In your last issue, and under the head of *Foreign Notes and News*, I see in your account of the proceedings at the Berlin Photographic Society that Dr. Schimann there produced a table showing the variation of the light during the day. That we are not behind our Teutonic brethren I wish to show, having at intervals, during the last two months, occupied myself in the construction of what I might call a registering actinometer, which is only just completed.

An endless band of sensitive paper is caused to revolve at the rate of about three-fourths of an inch per hour under a narrow slit, the motion being taken from the little finger-shaft of an American eight-day clock, the light of the northern sky being allowed to fall on the slit.

I enclose you one of the slips, showing the various changes of light during the day on August 1st from ten a.m. to seven p.m., after which time the action has ceased. In this the sun at one time managed to reach it, but by now placing it in a better position such would not occur.

I am not yet decided on the best sensitive surface. The yellow bichromated paper would be the most regular and more to be relied on; but the image, when washed, is too weak. The reversal of the image by nitrate of silver, giving the effect of light as white, would perhaps be best, but I forget whether or not these could be fixed; at anyrate, they would only be required to be kept for parts of a month, when the whole register for the month could be copied and reduced on to one sheet.—I am, yours, &c., WALTER B. WOODBURY.

*August* 2, 1875.

## URANIUM IN THE NITRATE BATH.

*To the* EDITORS.

GENTLEMEN,—You are in error in saying I have declined to give the formula for the addition of uranium to the nitrate bath. I propose to take an opportunity of bringing the question before the Photographic Society after the vacation.—I am, yours, &c.,

*August* 3, 1875. H. STUART WORTLEY.

## "A MODERN ATHENIAN ON THE EDINBURGH PHOTOGRAPHIC SOCIETY."

*To the* EDITORS.

GENTLEMEN,—A letter, with the above title, signed "A. W. Steele," appeared last week in your Journal. As its statements are of a character to mislead people at a distance from Edinburgh, allow me to make a few running remarks on the said production.

In his letter he informs the public that when garlic is planted near a rose-tree it "assists the Queen of the Parterre to maintain her throne with greater magnificence and increased loyalty," intimating at the same time that he is to be the "garlic" to our Edinburgh Society; and trusting that the Society will exclaim—"'Sweet are the uses' of adverse criticism, 'which, like the toad, ugly and venomous,'" &c. These allusions to himself and his criticism are unobjectionable. He then states his ideal of a holiday. He says the photographer, "what time the pea puts on the bloom," should "enjoy on a heathery knoll 'the soft recumbency of outstretched limbs.'" And so he goes on through half a column, with all the grace and brilliancy of a man exhibiting on a tight-rope; but when he descends from fancy to fact he may be fairly said to tumble from his rope.

Your correspondent upbraids our Society for sailing on a canal, which he calls "an odoriferous bath" where "cats and dogs find inglorious sepulture"—quite a new piece of wit. Now the fact is that, on the splendid summer day of our trip, the canal, winding in varied reaches through a beautiful country, had quite the character of a calm English river as the barge glided pleasantly along, the water being garnished here and there with the broad-leaved plants generally found in sluggish streams, cat and dog being as invisible as Mr. Steele himself.

Mr. Steele then declares that "the proceedings" were "vulgar in the extreme, discreditable to the Society, and unworthy of those," &c., &c. Mr. Steele seems to have a wonderful feeling of dignity; but his idea of vulgarity may possibly be peculiar. As, however, he was not present, he should have had some modesty in stating his opinion. I accompanied the trip with great pleasure, and enjoyed exceedingly the dancing and singing of the young people beneath the picturesque awning, especially when the splendour of the day and the beautiful views were taken into account. It was a day of complete relaxation and innocent hilarity; such a day as gives that "touch of nature" which draws society together—pleasant in its enjoyment and useful in its results.

Mr. Steele insinuates that all the party were more or less tipsy. As a patron of sobriety he will be glad to learn that his statement is as utterly untrue as a statement can possibly be. There are other points—such as games and foot-races, got up for the edification of the younger folk—at which our "garlic" vents its perfume in a surprising manner. But the subject need not be pursued.

In writing about our Society Mr. Steele very properly calls himself an "outsider;" and I must say his writing recals to my mind the feeling evinced by another "outsider," of dark complexion, who, as Milton says, looked on Adam and Eve reclining in their nuptial bower, and turned away grinning with envy—no doubt not admiring, as Mr. Steele does, but sufficiently cursing—

"The soft recumbency of outstretched limbs."

—I am, yours, &c., W. NEILSON.

*Edinburgh, August* 2, 1875.

## PROCESSES AND PATENTS.

*To the* EDITORS.

GENTLEMEN,—It seems to me that M. Lambert's letter is written in sufficiently good English to warrant one in believing that he understands the meaning of every sentence he has written or quoted, and I maintain, therefore, that he has no right to assume that Mr. Croughton only intended to use one side of the tracing-paper for working on with pencil. The sentence in Mr. Croughton's letter may be understood to mean that the paper is useful for working upon on *both* sides. It would appear from M. Lambert's letter that he claims specially the use of "stumps." A pencil may be hard or soft, and a "stump" is only a modified pencil, and, moreover, could not be used for small work. I have said nothing about "six months'" use of the method prior to M. Lambert. I was shown the "dodge" *several years* since.

While writing I would call attention to another "new" patent, also from a French source. This "dodge" is for the purpose of making photographs appear to be painted in the ordinary way, but by a very expeditious method. The paper photograph is to be made semi-transparent, then smeared all over with appropriate colours on the back, then mounted, and afterwards touched up on the front. Now all this has been already published many months since in THE BRITISH JOURNAL OF PHOTOGRAPHY. I would caution all who may desire to use this "dodge" that there is much danger of their work turning yellow unless great care be used in the selection of the material for rendering the paper transparent.

Referring now to another matter. If Mr. Winstanley will discard verbiage and say plainly what he means I shall be glad to reply to him; but as I did not refer to his "so-called" secret process advertised so largely a few months since, and in one of which advertisements I allowed my name to be used simply to testify to the truth of certain results, I think it as well to say that if I had previously seen an article in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1874, page 69, the use of my name certainly would not have been permitted. The following quotation from one of Mr. Winstanley's wordy effusions will, I think, be appropriate:—"Residents in vitreous establishments should not indulge in the projection of lithic missiles;" and I hope he will see its application to himself. As I have never advertised or offered for sale any secret "process" or "dodge" I fail altogether to see the point in your correspondent's letter.—I am, yours, &c. A. BROTHERS.

*Manchester, July* 31, 1875.

P.S.—Since my letter was despatched my attention has been directed to the following article, by Mr. Croughton, in the *News* almanac for 1874, page 67:—"On the *film side* of the negative was strained a piece of ordinary tracing paper, * * * and gave a good surface for working in the high lights," &c. As M. Lambert only claims the use of the semi-transparent paper on the film side, surely the above quotation settles the whole matter.—A. B.

*To the* EDITORS.

GENTLEMEN,—Permit me, in the name of a goodly band of your constant readers, to enter a protest against the prevailing and, I am sorry to say, growing custom of filling up the valuable pages of the Journal with a mass of correspondence on the merits and demerits of alleged inventions, and the validity of the patents connected with them, for turning out artistic productions adapted for the use of the meanest capacities—inventions and patents whose only claim to notice in connection with photography is that of doctoring the photographs after they are produced. We who are really interested in the art and science of photography can take no interest in these discussions. The priority of Jones over Brown, and the minute differences by which Jones distinguishes his patent "smearing" from Brown's patent "smudging," have no charms for us or anybody else, I should think, except the parties themselves.

To discuss the validity of patents can end in no result but that of provoking a smile from a legal reader at the simplicity which can induce partisans on either side to enter on so utterly useless a proceeding. If

each of the parties is so cocksure of his rights, for heaven's sake let them air their disputes in the only place which can effectually settle them—a court of law; do not let the pages of our Journal be filled with such useless trash to the exclusion of that good and sound matter which you are so capable of supplying. Morrison's pills are, no doubt, very good things—for the dealers wholesale and retail; but what should we think of a scientific or professional journal which condescended to notice them in its pages, or discussed the relative rights of the patentees of such articles?

Photographers are ever declaiming about their "status." Surely I am right in attributing to such men higher aims and aspirations than busying themselves with "How to make backgrounds with a blacking brush," or "How to secure expression in the sitter by rubbing his cheeks with a brickbat," or some such wonderful inventions as are constantly trumpeted forth. The advertising columns is their place. "A plague o' both your houses!" say we. Photographs thus doctored, besmeared, and besmudged have no longer any right to the title of photographs, or the maker of them to that of artist; and they can make no legitimate claim to occupy page after page in a journal devoted to photography.

Doubtless I shall be told they sell well and are profitable, and the argument is unanswerable in a commercial point of view; but it certainly does not say much for the artistic discernment of the million who purchase. "'Tis true, 'tis pity, and pity 'tis 'tis true." Even Mrs. Cameron's "woollytypes" are genuine photographs, and the undoubted artistic sentiment is seen in them, though marred by an eccentric craze in their manipulation and frequent grotesqueness in composition.

Do pray, Messrs. Editors, spare us as much as possible these discussions on "tweedledum and tweedledee."—I am, yours, &c.,

*August* 4, 1875. ANTI-QUACK.

P.S.—As an old editor I am not insensible to the conveniences of "padding" and gratuitous "copy," and plead guilty myself of having yielded to the temptation of sending such matter to the printer without due consideration of its quality or regard for the feelings of my readers, and can therefore make every allowance.—A.-Q.

## THE LAMBERTYPE PATENT.

*To the* EDITORS.

GENTLEMEN,—That my knowledge of patent law may not be so extensive as that of M. Lambert I am quite ready to admit; but that any blunder was made in saying what I did thereon I distinctly deny. The error lies with M. Lambert taking it for granted that any and every legal point mentioned had direct application to the patent No. 1634, A.D. 1874. M. Lambert will pardon my pointing out his error.

The controversy has been brought to a focus much sooner than I had anticipated. M. Lambert says in his specification:—"What I *claim* * * is the method of applying a semi-translucid sheet on each side of a negative or positive, and of quickly and readily retouching by operating on these surfaces." This may mean the "method" or the application; however, as the specification does not describe the method, it must mean the application. As this has been employed before he now drops the *claim* to a "semi-translucid sheet," and falls back upon the retouching of the two said surfaces.

I know you may *describe* a thousand old things in a specification, and also know you must not *claim* one. For instance: I might *describe* the crank motion, and apply such motion in an invention in a perfectly valid manner; but were I to *claim* the crank motion, and such claim be allowed, I could stop nearly every engine in the country. The difference between describing and claiming is well and very justly provided for in English patent law. However, leaving M. Lambert to get out of this difficulty as he pleases, let me take his version, viz.:—"We use the two sheets as simple vehicles for retouching."

Now my imperfect knowledge of patent law will allow me to say this much:—If Mr. Croughton had used paper on both sides, but simply retouched on one, say the back, and others had used paper on both sides, but retouched only on the front, such would not invalidate M. Lambert's claim to the use of both surfaces conjointly for retouching, assuming that to be his claim; yet, if it can be clearly shown that the use, conjointly, of both surfaces for retouching upon with the aid of stump, powders, &c., has been general in the past, such would invalidate any claim for the same thing if made at a subsequent date. I know those who have, and do still, retouch on both sides, and have themselves been taught, and they can show where it was, and is, in constant practice, and that at a date prior to May 8th, 1874.

The absurdity of the challenge is obvious. "Messrs. Fry, Batho, Brothers, and Slingsby" would be foolish indeed were they to accept it as it is worded, because they would be bound to produce so-called chromotypes, as M. Lambert includes "all the different results" obtained by his patented processes, and ties the aforesaid to Croughton's alone. M. Lambert is probably a clever manipulator, but skilful use does not establish the right to any material; hence any test where parties would use exactly the same agents could be but a test of their skill, and would fail as a test of the validity of a patent—indeed, it has nothing to do with it.

Assuming that I took up M. Lambert's challenge, I should use exactly, or rather similar, agents as himself, and thus his boasted test would be one merely of skill, and not have any connection with the validity of his patent; such can only be decided by the Court of Chancery. The profession are well aware of this, and know what value to put on a challenge that bears some similarity to that of the man who owed a shilling and offered to test his liability by a fight.—I am, yours, &c.,

*Halifax, July* 31, 1875. W. E. BATHO.

*To the* EDITORS.

GENTLEMEN,—Very few words can now be required to close the Lambertype discussion. When no more powerful argument can be found than to offer to wager or stake £50 by M. Lambert the end must be near.

It remains only for me to say that the evidence is now conclusive that Mr. Croughton invented and published the method of papering both sides of the negative, and working or retouching thereon as desired. He showed negatives of this kind when he read his paper, as was abundantly confirmed by members of the South London Photographic Society at their meeting on Saturday last. I also saw them and at once adopted the process, and communicated it to Mr. Slingsby, who has used it on a large commercial scale ever since. All logic and argument are useless in the face of such facts, supported by incontrovertible evidence.

Since I visited M. Lambert, and saw his work and his negatives, no change of any kind has been made in my operation. I already had all I wanted and all he had to sell.—I am, yours, &c., SAMUEL FRY.

*Surbiton, August* 3, 1875.

## PHOTOGRAPHERS' HALF-HOLIDAYS.

*To the* EDITORS.

GENTLEMEN,—Having read the letter of the Secretaries of the West Riding of Yorkshire Photographic Society, contained in your last issue, allow me in reply to state that it was not a captious spirit of opposition which prompted me to take exception to the report they name, but a desire to prevent the consequences that might arise from the publication of the error. Your influential Journal is seen by other people besides professional photographers, therefore the misstatement I pointed out would probably have caused inconvenience had it been allowed to pass unnoticed.

For the same reason I again ask your permission to take exception to the new statement that all the photographers in the town of Leeds were invited to attend a meeting for the purpose of considering a plan for closing their studios half a day every week. I, for one, received no such invitation, nor has the convening or holding of any such meeting come to my knowledge. The real facts of the case are, I believe, as follow:—A partial canvass of the photographers here by a respectable member of their body, who is in favour of the above-named proposal, was made with a view to induce his brother artists to fall in with it, but objectors were met with, and I felt it my duty to be one of them—not, I again assure the promoters, from merely factious motives, but from a conviction that the scheme they were seeking to promote was neither for the public convenience nor for our advantage.

An occasional holiday is, no doubt, a good and desirable thing; but surely it can be given or taken without the formality of closing our studios more than one day in seven.—I am, yours, &c.,

*Great George-street, Leeds,* WM. HANSON.
*August* 4, 1875.

NOT BAD!—An enterprising firm of photographers advertise a new series of "photographs in miniature." This ought to take. Most of us have friends of whom it may be said that the less we see them the better we like it.—*Judy.*

PIRATING COPYRIGHT WORKS.—At Wandsworth Police Court, on Friday last, the 30th ult., John Patrick Conroyce, picture dealer, living in Battersea, was brought up for final examination on the charge of selling photographic copies of copyright paintings. Mr. George Lewis again appeared for the prosecution. The prisoner made an application for another adjournment, but it was refused. Mr. Lewis informed the magistrate that the negatives had not been produced. The prisoner said they could be produced if required. The daughter was called into the witness-box and sworn. She said they had some negatives at home. Mr. Lewis inquired what had become of the negative of the *Roll Call*, the copyright of which had cost £1,600. The daughter said it was broken. The sketch was at home. She printed it by her father's directions. She supposed she printed the others. The negative of the *Railway Station* was in the kitchen. Another appeal was made for an adjournment, but Mr. Ingham said he should not put off the case; it was merely trifling with the administration of justice. He then convicted in seventeen cases, imposing a penalty of £5 in each, with the alternative of four months' imprisonment. He also made an order for the forfeiture of the negatives and copies.

## EXCHANGE COLUMN.

No charge is made for inserting these announcements ; but in no case do we insert any article merely *offered for sale*, that being done at the small cost of one shilling in our advertising pages. This column is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

Wanted, in exchange for a carved oak chair, Cusson's posing-chair, head-rest, ebonite bath and dipper, &c., a solid background, cottage, rustic or gothic.—Address, H. Bailey Eldwick, Post-office, Bingley, Yorkshire.

A 10 by 8 Ross's medium-angle doublet offered in exchange for a Ross's 10 by 8 instantaneous or A doublet, Ross's 10 by 8 rapid symmetrical, or No. 2B Dallmeyer's patent. Difference in cash.—Address, N. Gillespie, Fivemiletown, Ireland.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

A. G. Massey.—In our next.

J. B. Bass (Bangor, Me., U.S.A.).—Received. In our next.

Rejlander Memorial Fund.—Received from Mr. Henry Cooper five pounds.

Provincial.—There is no method short of repolishing by which the roller can be utilised.

J. B. Jones.—Unless we saw a print from the defective negative we could not indicate the cause of the defect.

H. J. Martin.—Your letter has been forwarded to the Secretary of the Photographers' Benevolent Association.

S. P., M.D.—Yout conjecture is extremely probable. We shall be glad to see you at the Bristol Meeting of the British Association.

J. C. S.—A mixture of burnt umber and whiting will give the colour required. But we advise you to purchase a background ready made.

F. S. K.—We are unable to add anything at present to the descriptions of the gelatino-bromide process published in the Journal and Almanacs.

Thomas Baker.—Of the various lenses in the inventory, we believe the fourth will prove the most useful. If you do not grudge the expense you will also find it advantageous to purchase the one standing second on the list.

J. C.—There is no need for an apology. The picture is very clever, but it must give great offence to the individual travestied. It is not libellous, but good taste and kindly feeling should prevent your continuing its further distribution.

Quekett.—There is no microscopic objective in existence that would photograph the butterfly named. You must use a portrait lens of short focus. A stereoscopic landscape lens of about three and a-half inches will also answer well for such a purpose.

J. Gunston.—1. The experiment you suggest shall be tried.—2. Any good, plain, tough collodion will answer. Let it contain a *small* portion of castor oil, and a larger proportion of pyroxyline than usual.—3. Some prefer glue for mounting photographs, while others prefer freshly-made starch.—4. By applying to any dealer in cameo-presses you will easily obtain a mask.

Observer.—The solvent powers of wood naptha are not altered by its purification or deodorising. To ensure success the filtration through charcoal would have had to be carried much farther than has been done in your case. Ten or twelve separate filters, each charged with freshly-burnt charcoal, will at the very least be required. You ought to study Eschwege's specification, which can bê obtained for a few pence at the Patent Office, Southampton-buildings, Chancery-lane.

M. H. writes as follows:—"In the number of The British Journal of Photography for January 22, 1875, at page 42, mention is made of a new form of stereoscope capable of receiving transparencies five inches wide, the invention of the late Mr. Sutton. As I am much interested in this subject I would feel much obliged if you let me know whether this form of stereoscope is made for sale, or, if not, whether you know any house in the trade which would have such an instrument made for me. I suppose the lenses are achromatic."——As we are unaware whether or not such a stereoscope is made for sale, we publish our correspondent's communication in order that it may meet the eye of some person able to give the desired information.

A. J. Robinson says:—"During my holidays in June, I got a very fair negative ($8\frac{1}{2} \times 6\frac{1}{2}$) of a landscape, with village, &c. After printing two off the negative unfortunately snapped from top to bottom. As I may not have an opportunity of taking the same view again, I should feel obliged by your giving, through the medium of your valuable Journal, any process by means of which the negative may be repaired or a new one taken from the broken negative."——In reply, we recommend the attaching of a sheet of very thin and strong paper to the back of the negative. Let the margins of the glass be gummed, and the paper made slightly wet before being attached to it. This will ensure its contracting and drawing into close contact the two halves of the negative. Now print a transparency by *contact*, using a dry plate for the purpose; give a good exposure, so as to ensure all the details being developed; retouch the transparency where necessary; and then, either by the wet or the dry process, by the camera or by superposition, print a negative from the transparency, retouching it also where required. The proofs obtained from such a negative will be scarcely, if at all, inferior to those from the original negative.

H. W. D.—1. There has been some impurity present, otherwise no such sediment would have fallen. The solution ought to remain nearly colourless for a considerable time, such colour as exists being of a pale greenish hue.—2. The reversing of the lenses in the tube will answer quite as well as if the whole tube were reversed in its jacket. What is required is that the back lens of the portrait combination be placed next to the negative from which the enlargement is to be produced.

Received.—W. J. S.; Arthur J. Sutton; T. G. A.

South London Photographic Society.—On Saturday evening last a large number of the members of this Society met at the residence of the President, the Rev. F. F. Statham, M.A., and partook of his hospitality. A very pleasant evening was spent.

Sensitiveness of Wet Emulsions.—When writing on the use of wet emulsion as a means of supplanting the bath in the ordinary wet collodion process in the studio we omitted to give a word of warning in connection therewith. A wet bromide film is exceedingly sensitive to coloured light, and hence more than the usual degree of care is requisite in order to prevent fogging.

The Vanderweyde Method of Lighting Studios.—From an announcement in our advertising pages it will be seen that we are unable this week to redeem our promise of giving an account of the new method of lighting the studio. We believe that now that the influences which always surround a bank holiday in the Metropolis are weakened, workmen will go on as usual, and the studio to which reference has been made will be finished without much further delay. A description of the studio and of some comparative experiments in lighting which are being carried on will be published, if not next week, at least in an early number.

A Breach of Contract.—During the past fortnight the case of Bovill *v.* Tuck was heard at the Westminster County Court, in which the plaintiff, a barrister-at-law, sued the defendant, a photographer, carrying on business in Regent-street, to recover the sum of a guinea and a-half, under the following circumstances:—From the opening of the plaintiff's counsel it appeared that the plaintiff was anxious to send a miniature portrait of himself to a friend in India, and that calling on the defendant in May said he wished it to be photographed and coloured in oils on the Friday following, stating to the defendant that unless the portrait was then ready it would be useless to him. It was urged on the part of the defence that no specific contract to return the work on the day named was entered into. The defendant's operator was called, and stated that the proof only of the portrait was to be sent on the day specified; but as the weather was very unpropitious at the time, it could not possibly be accomplished. The Judge, in reviewing the facts of the case, considered that the defendant had entered into a contract which he had not fulfilled, and that the plaintiff was entitled to the money he had paid to the defendant. Verdict accordingly entered for the plaintiff with costs.

☞ **Editorial Communications should be addressed to "THE EDITORS"—Advertisements and Business Letters to "THE PUBLISHER"—at the Offices, 2, York street, Covent Garden, London, W.C.**

## METEOROLOGICAL REPORT,

*For two Weeks ending August* 4, 1875.

Observations taken at 406, Strand, by J. H. Steward, Optician.

These Observations are Taken at 8.30 a.m.

| July. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 22 | 29·74 | NW | 57 | 60 | 69 | 56 | Dull |
| 23 | 29·72 | W | 55 | 57 | 70 | 55 | Raining |
| 24 | 29·69 | W | 58 | 60 | 70 | 56 | Cloudy |
| 26 | 30·32 | W | 51 | 55 | 74 | 49 | Fine |
| 27 | 30·38 | SE | 54 | 60 | 72 | 53 | Fine |
| 28 | 30·28 | E | 58 | 61 | — | 54 | Fine |
| 29 | 30·39 | E | 58 | 62 | 79 | 55 | Dull |
| 30 | 30·13 | W | 59 | 65 | 76 | 58 | Dull |
| 31 | 30·15 | N | 51 | 56 | 70 | 54 | Cloudy |
| August. | | | | | | | |
| 2 | 30·25 | NE | 51 | 54 | 73 | 51 | Cloudy |
| 3 | 30·12 | E | 55 | 59 | 71 | 53 | Dull |
| 4 | 30·13 | NE | 54 | 58 | — | 52 | Cloudy |

CONTENTS.

THE BRITISH
# JOURNAL OF PHOTOGRAPHY.

No. 797. Vol. XXII.—AUGUST 13, 1875.

## NEGATIVES FOR ENLARGING.

Any expedient which is calculated to diminish labour in connection with outdoor photography is certain to find favour in the eyes of amateurs; hence the almost universal adoption of dry plates in preference to wet, and the interest which has been recently evinced in the substitution of paper for glass. One such expedient, however—and one, too, specially valuable to the most heavily burdened of amateurs, those who work upon large plates—does not seem to find very general favour. We allude to the plan of taking very small negatives to be subsequently enlarged.

That the bulk of amateurs should stand aloof from this method of working is not to be wondered at in the least, for the very name of enlarging seems to be connected with difficulties out of number; but, considering the numerous advantages to be gained, it does seem strange that so few of the more intelligent amongst our amateurs should be found willing to face the obstacles placed before them.

That equally good, if not better, results may be obtained by enlarging a small negative is fully proved by the magnificent enlargements of that nature which have recently been exhibited by various firms, and which, moreover, are in most cases made from negatives not specially intended for the purpose. If such be the case, how much better may we not expect the work to be when negatives have been used which have been taken with the very object of being enlarged!

The principal advantages of the method in question are economy, rapidity, and perfection of detail, in addition to the saving of labour. The small dimensions of the apparatus for outdoor work, extending, as it does, from the camera and lens to plates, boxes, and we may even say to porterage expenses, must necessarily effect a very considerable diminution in the expense of a tour. The use of a small plate enables us to employ a lens of short focus, and one which will probably work with a large stop, hence the gain in rapidity; while such a lens, giving, as it does, far greater sharpness and depth of focus than one constructed for large plates, enables us to produce an enlarged negative more generally satisfactory as to detail than would be possible in taking such a negative direct.

A most important question arises as to how far the process of enlargement may be carried without injuring the detail of the enlarged picture. The answer to this question must depend to a very large extent upon the lens employed, and also the care exercised in the production of the small negative. The nature of the image as regards structure will also prove a disturbing element, especially if the enlargement be carried to any great extent. Probably an amplification to three or four diameters will be sufficient for all ordinary requirements, though to prove the possibility of going far beyond that limit we may cite the instance of Professor Piazzi Smyth's photographs of the pyramids, which were originally one inch square and bore enlargement up to ten inches without any loss of sharpness; a portion of the enlarged transparency projected upon a screen twelve feet square still exhibited very little loss of detail. These negatives, of course, were taken for the special purpose of enlarging, but, on the other hand, we have seen an enlargement from an ordinary 8 × 5 negative to 30 × 18, or nearly four diameters, which we considered far superior in detail and sharpness to a negative of the same size taken direct.

As regards apparatus, there are now both in England and on the continent numerous different forms of complete apparatus in the market, so that little trouble need be feared on that score, the only point to be decided being as to size. The favourite size with manufacturers appears to be 5 × 4 and quarter-plate; the former is preferred by many to the latter. With respect to the lens all we can say is that it should work as sharp as possible and give perfectly straight lines.

A most convenient form of "pocket" camera we saw some years ago, and which was constructed by an amateur, consisted of a small camera for plates 3 × 3 with repeating back—that is, with slides to hold a double-sized plate (6 × 3) upon which could be taken two pictures. Three double slides of this description thus contained twelve pictures. The lens used was a foreign doublet of about two and a-half inches equivalent focus. Negatives taken with this lens bore enlargement up to 12 × 10 without visible loss of sharpness even at the edges.

The selection of the best process to employ is a matter of greater difficulty, owing to the number of processes and variety of opinion as to their qualities. We shall indicate, however, a line of practice which, for reasons that will be obvious, we consider the best. In the first place, let us pause to consider what object we have in view and what class of negative we wish to produce. The sensitive film must be of an even texture and free from granularity; the developed image must likewise possess similar properties, or the details of the negative will be ruined. Then, again, our object is to produce a negative almost microscopically sharp, full of detail, and as soft as possible without being flat; density, as usually understood, we do not require. These conditions are, to our thinking, most nearly fulfilled by a washed emulsion which has been prepared for, at least, two or three weeks. The particles of bromide are by that time in the finest possible state of division, and the film produced, being free from all soluble matter, is not rendered spongy or granular in the course of development. The latter is an important point, which we do not recollect to have seen mentioned previously in connection with washed emulsions. Provided the emulsion be old enough, it gives an even and *continuous* film of silver bromide of a much more homogeneous nature than an ordinary one; for it must be remembered that a film treated with a preservative has its pores filled with dried organifier, which is dissolved in the course of development, leaving a surface resembling, to some extent, a fine sponge.

Our *modus operandi* is as follows:—After exposing the plate in the usual manner (no special precautions being necessary up to that point) the development is commenced by flooding it with a mixture of methylated alcohol and water in equal parts. Return to the developing-glass, and add to each drachm three drops of a sixty-grain solution of pyro. in alcohol and one or two of a saturated solution of carbonate of ammonia. Apply this until the details are fully out, but especial care must be taken not to induce fog. The image is next to be intensified; but as we have the choice of distinct lines of action subsequently, each requiring a different treatment, we may pause here to explain the principle.

It is now eight years since Major Russell published the fact that an alkaline-developed bromide negative might be changed to a positive by treatment with nitric acid and redevelopment, and in our ALMANAC for 1873 Mr. Jennings pointed out how to make this fact practically useful for enlarging purposes. The question, however, arises—Is it preferable to transform the original negative into a positive, from which to produce direct an enlarged negative, or to leave the negative intact, treating the enlargement with nitric acid? Each plan possesses advantages, and we have no doubt some will prefer one, some the other; we will, therefore, describe separately the mode of procedure in each case. If the small negative is to be reversed it is necessary to continue the development until the bromide is reduced in the high lights throughout *nearly* the whole thickness of the film (this is easily ascertained by examining the back of the plate from time to time), while in the deepest shadows the detail is fairly visible; in other words, the plate must be decidedly overdeveloped. A few trials and the exercise of a little judgment will soon enable an intelligent amateur to judge the proper length to carry the development.

After carefully washing the plate the film is to be treated with dilute nitric acid until the whole of the reduced silver is dissolved, leaving a positive impression in bromide of silver. If a very dense film be employed it will sometimes be unnecessary to treat the image any further, but in ordinary cases it will be requisite to redevelope. This is done by the alkaline method after a brief exposure of the plate to light. It frequently happens with certain samples of pyroxyline that not even the small amount of density necessary for our purpose can be obtained after the acid treatment; in such cases the chloride of copper intensifier we described a few weeks ago will answer admirably.

If the small negative is to be retained as a negative, the development is similar to the ordinary method, the object being to secure softness and delicacy of detail without too great density. This is attained by the use of a moderately-strong solution of carbonate of ammonia, a weak alkaline developer tending to hardness and transparency in the shadows. Our own choice is in favour of subjecting the enlargement to the acid treatment, keeping the small negative at hand in case of accident. It will be found also much easier to judge of the value of the original negative than to grope in the dark, as it were, with a transparency.

After drying, the plates should be stored away carefully without varnishing; or, if it be desired to place them beyond danger of scratching, they may be coated with diluted albumen, one part to two of water, and dried as rapidly as possible in a place free from dust.

## GLYCOCOLL.

SEVERAL inquiries having lately been made respecting the nature and action of glycocoll and its photographic uses, we devote the present article to a consideration of that substance.

Glycocoll, or glycocine, is, as we recently stated, formed by dissolving gelatine in sulphuric acid. Its value in connection with photography consists in its restraining power when added to a developing solution of protosulphate of iron. About ten years ago we bestowed a great amount of attention on the subject of the addition of gelatine to iron. This was about the time that the exceptional advantages of this addition was discovered and pointed out by Mr. M. Carey Lea. Let us be understood aright: we do not here refer to an addition of a simple solution of gelatine to the developer; for, although this confers those physical properties upon the solution which cause it to flow with a most agreeable degree of smoothness, yet the chemical action is so slight as to warrant us in stating it to be inert.

Glycocoll, although not so designated by Mr. Lea, is really formed in his ferrogelatine developer. Its peculiar action is that of a fog-restrainer of great energy; so powerfully does it act in this capacity that it may be allowed to remain on the plate not merely till the image is fully developed, but until all the details have acquired great intensity, in a manner similar to that given by an intensifier of citro-pyrogallic acid and silver.

The important question now arises—What is the best method of making this sulpho-gelatine solution so as to possess the maximum degree of efficiency in the developer? Mr. Lea recommended two methods, differing from each other only in a slight degree. An ounce of gelatine is soaked in two ounces of water, and after the gelatine has become swollen from the absorption of the water, it is warmed *very slightly* until the liquefaction takes place. After this five measured drachms of sulphuric acid are added by slow degrees, the mixture being stirred during this addition with a glass rod. Chemical combination begins to take place at once, and the gelatine becomes far more fluid, acquiring a peculiar odour. The vessel containing this solution is now set aside for several hours to ensure the combination of the gelatine and acid being complete, after which iron filings are added in excess. These dissolve more slowly in this fluid than they would in simple sulphuric acid; hence the vessel should be set aside in a cool place for two or three days, an equal bulk of water having been previously added to the sulpho-gelatine. Next add about half-a-drachm of acetate of soda, filter, and make up to fifteen ounces by the addition of water.

In our experiments recorded at the time we adopted a slight modification of the second of Mr. Lea's formulæ, and which we considered an improvement upon it. This we shall describe. In an open porcelain dish mix one ounce of strong sulphuric acid with four ounces of water. Set aside for half-an-hour to cool; then add four hundred grains of Nelson's gelatine, pushing it under the dilute acid with a glass stirring-rod. Put away the vessel in a warm, but *not* hot, place, and occasionally stir the contents to facilitate solution. In about twelve hours the gelatine will be completely dissolved. Then add an excess of iron filings, avoiding the application of heat. Effervescence commences at once, and goes on briskly for several hours. When it moderates add another ounce of water and stir well. This should be repeated once a day for three days or until all symptoms of effervescence have ceased after the solution has been well stirred up. Dilute down to twenty ounces and then filter. In warm weather we found it necessary to dilute to a greater extent than here described, or to about thirty ounces. The solution is still acid from an excess of sulphuric acid, but the addition of about two drachms of acetate of soda remedies that.

If the experiment be conducted as here described we guarantee the resulting fluid to be an excellent developer which will not stain or fog the plate, even if it be left on for a considerable period. It gives negatives having a rich, fine bloom with considerable density, further intensity being obtained by a second application of this organic developer mixed with a few drops of silver. The colour of the solution is pale green, similar to that of an ordinary solution of protosulphate of iron.

The addition of the acetate of soda sets free acetic acid, owing to the combining of the excess of sulphuric acid with the soda. Many of our readers are engaged in the copying of engravings and in the preparation of lantern transparencies by the wet collodion process. Let them try this developer, and they will be pleased with the beautiful black, vigorous tones obtained by a single application.

In the course of a private conversation with Colonel Stuart Wortley that gentleman has kindly promised to give us for our next number the formula by which he prepared the glycocine that was added to the developer on the occasion when he produced the fine large portrait to which allusion has been recently made.

Glycocoll, when required by itself, was originally obtained by the action of cold concentrated sulphuric acid upon gelatine; but it is now known to be formed along with benzoic acid when hippuric acid is treated with boiling hydrochloric acid. Cooley described it as being sweet-tasted, colourless, crystallisable, freely soluble in water, and uniting to form crystallisable compounds with a number of other bodies like cane and grape sugar. It has been by some termed "gelatine sugar."

## DEVELOPMENT.

ALTHOUGH we have frequently expressed our opinion that the time is not far distant when a dried film will altogether supersede wet collodion in the studio as well as in the field, we know that until that "good

time" comes anything tending to shorten the exposure for ordinary studio work cannot fail to be interesting to photographers generally. In common with many of our brethren of the camera we have long held, and frequently expressed, the opinion that an instantaneous exposure will be found sufficient to produce the necessary latent image if we only knew how to bring it into visible existence; in other words, our energies should be turned in the direction of development, as to that in which the greatest possible rapidity is most likely to be found. This must be our apology for again returning to the development of the image on the wet collodion film as a theme on which to write.

It does seem rather strange that, while such progress in the various departments of photography has been made during recent years, the development of the latent image should remain pretty much the same as when first discovered. A film of iodide of silver, or of bromo-iodide of silver in presence of considerable excess of nitrate of silver, is acted on by light, and, in consequence, acquires the power of attracting and holding fast particles of metallic silver, if they be presented to it at the moment of reduction, or in what may, for convenience, be called the nascent state. Those particles of metallic silver are, of course, obtained from the solution of silver nitrate with which the film is covered, and which has the formula of Ag K N $O_3$, the elements of which hang so loosely together that the oxygen, or part of it, is very readily given up to any body which has a tolerably strong affinity for this gas.

The body which has hitherto been found to answer best is, as is well known, the protosulphate of iron; and so great is its inclination to pass into the higher oxide and, consequently, its power as a reducing agent that probably nothing more suitable as a developer is likely to be discovered. But this reducing power of the iron, like a great many other powers in the world, requires to be closely watched, and kept to a certain extent under restraint, otherwise it has a tendency to throw down the silver faster than the light-affected iodide can take possession of it, the result being the familiar and much-disliked fog which settles all over the plate, obscuring the image and rendering the negative useless. There is little doubt that if, under all conditions, we could develope with a pure and tolerably strong solution of protosulphate of iron the maximum of rapidity would be attained; but as that cannot be done a restrainer, generally in the form of an organic acid, is almost universally used. Now while the higher lights of the picture—those portions which have been most fully acted on by the light—may come out equally well with the restrained as with the unrestrained developer, this is far from being the case with the middle tints, the delicate detail upon which the beauty of a negative so much depends, and which cannot, with the restrained developer, be coaxed into existence without a considerably longer exposure than would be required if no restrainer had been used.

Photographers generally are of a very conservative disposition, and seem to have much hesitation in the adoption of anything out of the beaten path, each apparently preferring to adhere to what he finds moderately successful rather than to try exhaustively any of the recommendations of the experimentalist. This conservative tendency may be carried too far, and we think it has been so in the almost exclusive use of acetic or citric acid in the developer. It is now many years since formic acid was pressed upon the attention of wet-collodion workers; and, although it is now an article to be found in the stock of wellnigh every chemist in the country, and sold at a price to warrant its general use, we think we are justified in saying that its virtues are little known and less appreciated; and yet we think that, if fairly tried and properly used, it would very soon altogether supersede both acetic and citric acids. From some experiments recently made we find that formic acid in very small quantity added to a plain ten- or fifteen-grain solution of iron, ensures perfect immunity from fog, without apparently in the slightest degree interfering with the reducing power of the solution; in fact, we think it rather tends to increase that power. Nor is it matter of surprise that it should do so, formic acid itself possessing the capacity of reducing silver nitrate to the metallic state, that reduction being, in fact, one of the principal tests by which it is recognised by the chemist.

While thus speaking most favourably of formic acid, there is another body which has recently been attracting considerable attention as a means of reducing the exposure; we allude to "methylal," a communication regarding which we published last week. This substance was recommended in one of the continental journals, some months ago, as an accelerator of great power; but, from a misunderstanding as to its composition, it then attracted very little attention. Now, however, that the misapprehension has been cleared up and the formula for its preparation published, we hope it will receive the attention which it seems to deserve. We have long had a predilection for the methyl and ethyl families, and were persuaded that amongst them would be found some that would be of much use in photography, and so we set about giving the methylal a fair trial.

The method of preparation we adopted was similar to that recommended by Mr. Warnerke, except that we used only half the quantity of manganese. Our still consisted of a large flask and a Liebig's condenser, the source of heat being a Bunsen burner, and we had no difficulty in getting off six ounces in less than half-an-hour. It was found to be considerably acid; but, when shaken up with a little carbonate of lime and redistilled, it came over quite pure, with an ethereal smell, and perfectly soluble in water. We may here add, for the benefit of any amateur who may wish to attempt its manufacture, that the flask should be capable of holding at least six times the quantity to be placed in it, as it sometimes froths up very much; also that the disagreeable bumping which, towards the end of the operation, sometimes takes place may be prevented by putting a few pieces of broken glass into the flask.

With methylal thus prepared, alone, and in conjunction with formic acid, we have made a large number of experiments; and, although they are not yet finished, and consequently we are not in a position to say what proportions may ultimately be found to be best, we say without hesitation that, with a developer containing fifteen grains of iron, twenty minims of methylal, and five minims of formic acid in each ounce, a negative containing more and much finer detail can be developed from a plate which has received an exposure of only ten seconds than could be got with the ordinary developer on a negative exposed for twice as long. This, at least, is the result of our experiments so far as they have gone; and we shall be glad to hear that both methylal and formic acid have received the attention they deserve.

Since the above was written we have been experimenting with formic acid, and were not a little surprised at the very small quantity that seems to be required to secure immunity from fog, a developer consisting of fifteen grains of iron and only two minims of formic acid giving most excellent results in about half the time required when the ordinary solution is used. So far as our experiments have gone we think the best developer we have yet tried is made of protosulphate of iron fifteen grains, sulphate of copper one grain, formic acid two minims, and methylal twenty minims. This keeps well, flows easily, and acts in every way satisfactorily.

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In the course of a recent visit we were much struck with a little piece of apparatus which may possibly interest our readers, namely, a contrivance for albumenising glass plates. It may seem to some a matter of little importance or, perhaps, an unnecessary refinement; but we can assure our readers that the ease and rapidity with which the plates may be coated is something wonderful, and, moreover, a more perfect substratum is thus obtained. The trouble arising from air-bubbles, dust, or filaments in the albumen mixture are too well known to need any notice here; and we think that any contrivance which offers a chance of getting rid of them is worthy of attention. The apparatus in question consists of a shallow porcelain trough, at each end of which a socket is formed in the solid material. The sockets carry the axes of a revolving roller, large enough to almost fill the trough, and covered with two or three thicknesses of stout flannel or felt cloth. So far the article in question is obtainable in commerce, being manufactured and sold under the name of "patent damper," its use being the damping of labels. As, however,

the size would most probably be restricted in the commercial article, in addition to its being expensive, we should recommend the substitution of a wooden trough made waterproof, which might be constructed by any joiner or cabinet-maker, and of such size as would suit the plates used. In use the apparatus is extremely simple; the trough is filled with diluted albumen to such a height that the roller will just dip into it, and as it revolves becomes saturated with the substratum. The plates are taken by the opposite ends and passed over the roller with slight pressure, the moistened felt leaving a thin coating of albumen behind it. There is no danger of air-bubbles, and, with proper precautions, no fear of dust; while, owing to the thinness of the layer of solution left on the glass, the drying is much more rapid than is the case ordinarily. The time saved in albumenising the plates is also considerable, as a dozen plates may be easily covered in three or four minutes.

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We do not imagine that optical knowledge is at as low an ebb among professional photographers in general as it is in one of the fraternity in particular from whom we have received a letter of nine pages describing the failures encountered during a recent and, evidently, protracted course of experiments in trying to obtain enlargements by means of the lime light. A high-class solar camera having been lately advertised for sale our correspondent became the purchaser, and on the authority of a writer in another journal he incurred a considerable amount of expense in having it fitted with lime-light appliances of the most approved description. The condenser—one of the usual plano-convex form—was twelve inches in diameter; and the intention was to use the camera for enlarging from 9 × 7 inch negatives. But, alas! only a very small portion of the centre of the negative could be seen on the focussing-screen. Much disappointment was felt and expressed, several friends in the profession were consulted, and many hypotheses formed, but all without avail. Such is the tenor of the long letter to which we have referred, and which concludes with a request that we should state his case to our readers in order to ascertain if any light could be thrown upon it. The enlarging camera, he *knows*, produced charming work while in the possession of the original owner, and its lenses have never been tampered with. The cause of the failure is so evident that it is surprising it could have proved, even for a moment, a source of mystification to such a committee of friends as our correspondent can gather around him. A solar camera has its condenser of such a focus as to bring parallel rays only—that is, those from the sun or at a distance—to a focus, this focal point being near to the front lens of the magnifying combination or objective. But in proportion as the source of light is made to approach the condenser so does the focal point recede, until eventually no focus at all is obtained, and the light is emitted in a diverging instead of converging form. Such was the state of matters which prevailed in the case in question. Instead of having the lime light situated within five inches of a twelve-inch condenser, let it be removed to a distance of *twenty feet*, and a great improvement will at once become manifest in the amount of the negative visible on the enlarging-screen. Owing, however, to the distance of the light the illumination will be very feeble. The only remedy for this is the employment of another condenser by which the rays emitted from the lime cylinder can be made to fall upon the solar condenser in a nearly parallel direction. Nothing short of this will succeed; and, what is more, the fulfilling of this condition will *ensure* success.

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## THE PHOTO-RELIEVO PROCESS.

No. IV.

### Fixing the Picture.

It is manifest that the pigmented gelatine which has already been dissolved in water may be so dissolved again, and, therefore, that a relievo picture, though permanent in the sense that it will not fade by chemical alteration as a silver-printed picture does, is nevertheless easily destroyed in the condition in which it leaves the press. Even in this state, however, it is quite as permanent as a water-colour drawing or an elaborately-stippled miniature. Nevertheless, Mr Woodbury very rightly considered it desirable to render relievo proofs unalterable by aqueous action, and nothing is more easily accomplished. After drying, the prints are immersed separately in a cold saturated solution of common alum for about five minutes, after which they are washed in a stream of water until no taste of alum can be perceived.

### Finishing the Picture.

Having been washed the pictures are hung up to dry, cut out, mounted, and rolled in the manner adopted in the case of common silver prints.

### Imperfections in Paper Prints, with their Cause and Cure.

In the relievo, as in any other process, failures may be met with. The following list is a categorical statement of the principal of these, with the nature of their cause and a statement of their cure:—

1. The print is incomplete, only a portion of it adhering to the paper. *Cause:* Adhesion to the mould or want of affinity in the paper used. *Remedy:* A sample of paper not so highly sized, or oiling of the intaglio, as the case may be.
2. The print is black all over. *Cause:* Want of pressure or coldness of the mould or ink. *Remedy:* Increase of pressure or heating the ink.
3. The print is "chalky." *Cause:* Over-pressure or ink too hot. *Remedy:* Diminished pressure or cooler ink.
4. The print is too dark in the shades. *Cause:* Too much colour in the ink. *Remedy:* Dilution with hydrated gelatine and water.
5. The print is feeble and has an under-printed look. *Cause:* A want of colour. *Remedy:* The addition of some more.
6. One side of the print is dark, the other light. *Cause:* Insufficient pressure on one side, or too much on the other. *Remedy:* Adjustment of the screws.
7. There is a series of white lines across the edges of the print. *Cause:* Ink too hot or not gelatinous enough. *Remedy:* Diminution of the heat or addition of more gelatine.
8. White spots and patches over the surface of the print. *Cause:* Dirt on the surface of the upper glass. *Remedy:* Removing same.
9. A granularity or mealiness over the surface of the print. *Cause:* Granularity of the paper used. *Remedy:* Rolling to produce a better printing surface.

### Transparencies on Glass, Opals, and the Like.

For the production of transparencies on glass a press is not required. A piece of plate glass is selected of the needed size, and warmed sufficiently to "just take off the chill." Ink is poured on to the intaglio, the glass then placed on the ink, and pressed down with the finger tips until the picture is *seen* to be the thing required. After standing for a minute or two the glass and picture are removed by gently raising with a knife. When dry a coat of varnish is given to the picture, which requires no further treatment. This process is extremely interesting, it being particularly pleasing to see a pool of ink flash into an exquisite picture under the simple pressure of the hand. Opal pictures and pictures on metal plates are produced in the same manner as transparencies on glass, but require more practice to ensure success, as the result is not visible until removed from the intaglio mould.

### Relievo Prints in Water-Mark.

With a breadth of grasp almost, if not quite, unique amongst the inventors of photography Mr. Woodbury has applied his process to divers purposes in a manner the neatness and felicity of which are suggestive of a mind in which the genuine lamp of genius burns.

Noticing that under pressure paper acquires a degree of transparency which it did not possess before, it occurred to him to roll a relief with paper on its surface through a press. This he did with the result that a picture in half-tone was left in *water-mark* upon the paper so employed. I believe such pictures gradually disappear again by the absorption of moisture from the air; but Mr. Woodbury may, I think, be safely trusted to rectify this fault if he should deem the matter worthy of his further work.

### Burnt-In Pictures on Wood.

A very pleasing and chaste method of decoration is adopted in some places of resort in Manchester, and, doubtless, elsewhere besides. The method I allude to consists in burning designs on wood with heated irons and then varnishing for preservation. To this decorative method Mr. Woodbury has succeeded in adapting the relievo process. A copper intaglio is made by electro-deposition; this is heated to redness over a Bunsen lamp, and then applied with pressure to the carefully-planed surface of a piece of box or other

hard wood. The higher portions of the copper plate (those corresponding to the shadows of the negative) come in strongest contact with the wood and burn it almost black, whilst the portions projecting to a less extent *scorch* the timber in proportion to their elevation, thus producing *half-tone* and making a picture of undoubted permanence and singularly pleasing in its beauty.

Relievo Trinkets.

I am not aware that the method of producing these has been actually employed, but the idea is certainly worthy of the effort of carrying into actual practice. It is as follows:—A bottle of copper is prepared whose sides consist of electro-intaglio moulds. A bottle of coloured glass is then blown in this copper bottle, using the latter as a mould. The glass fills up the spaces of the intaglio, and produces a *facsimile* in relief. This *facsimile* is then cut up and a bottle made of it with the designed surfaces inside. Another bottle of clean glass is then blown in this, and by welding becomes a part thereof. The sides of this compound bottle are then cut out and ground on their coloured faces until the white glass just begins to show. The result is a block of solid glass, smooth and flat on both its sides, and containing within its substance an accurate photograph in half-tone, capable of being seen in its perfection when examined by transmitted light.

Relievo Printing by Machinery.

Some eight or nine years ago I had the honour of rendering Mr. Woodbury some assistance in devising a machine for the automatic production of relievo prints. An intaglio mould was impressed upon the surface of a metal roller. An endless band of metal was so disposed as to exert a given pressure on one half of this cylinder. Between this endless band and cylinder the paper was fed in, the ink being allowed to fall upon the paper from a hopper as it passed. I am not aware that this apparatus is actually in use, though when I saw it last it certainly was full of promise—some yards of prints having been produced continuously thereby. D. Winstanley.

## FOREIGN NOTES AND NEWS.

Photography by Artificial Light. — M. Pokorsky-Joravko's "Porcelain Collodion."—A Promised New Dry Process.—The Exhibition of the "Industries Maritimes et Fluviales and of the French Geographical Society.—Dr. Monckhoven's New Work.

In the *Moniteur* M. D. Pokorsky-Joravko, a member of the Photographic Society of France, gives an interesting account of his experiences in what he describes as "nocturnal photography." Under this title he includes the production of glass positives for the stereoscope, copies of maps, charts, designs, manuscripts, and impressions of lace or other textures. In microphotography the writer of the article also gives preference to artificial over solar light, as being more constant and causing less inconvenience from concentration of the heat rays. The means employed are extremely simple. A rough framework is made of cardboard, within which two kerosine lamps are so placed as to throw their light upon the object to be copied from opposite sides. The apparatus, when ready for use, is open in front, the three other sides forming the half of a sexagon. The side walls are made double so as to contain the lamps, which are so arranged as to cast their light upon the centre portion of the apparatus without being themselves visible from the outside. Each lamp is equal to four candles. The plates used by M. Pokorsky-Joravko are prepared by the serum dry process and are extremely rapid, requiring but twenty to twenty-five seconds' exposure with an ordinary landscape lens in daylight. The plates are prepared with a bromised collodion, sensitised in an eighty-grain silver bath, and, after thoroughly washing to remove the silver, treated with a preservative composed as follows:—Milk (without the cream) four ounces, water eight ounces, citric acid one or two grains. This mixture is raised to the point of ebullition two or three times or until the caseine forms, when it is filtered, and, after cooling a little, the white of an egg is beaten up and added; it is again raised to the point of ebullition, and again filtered. It should now be quite clear. To twelve ounces of the clear liquid are added three grains of pyro., and the preservative again filtered. The development is performed by the ordinary alkaline method. For positives the writer uses an albumenised paper salted with bromide, the formula for which he gives, and which is sensitised, washed, and treated with the serum preservative in a similar manner to the plates. It will keep well for at least a month after preparation. An exposure of about a quarter of an hour is necessary with the two-lamp apparatus described above, and the development is effected by means of a solution of pyrogallic acid and acetate of lead; if the solution be milky nitric acid should be added, drop by drop, until clear. No silver is to be added, as it forces out the image too rapidly and forms a brown deposit in the paper.

The same gentleman gives a formula for what he has called "porcelain collodion," and which forms a surface resembling ivory or fine porcelain. It consists of ordinary plain collodion containing six grains of pyroxyline in each ounce, to which is added about two per cent. of gum myrrh. The gum is dissolved by shaking from time to time, and, after allowing the mixture to settle, the clear portion is decanted. It may be used for backing transparencies, for producing the effect of ivory or porcelain pictures, or as a substitute for ground glass in the camera. It may also be coloured by means of aniline colours and numerous pleasing effects obtained.

M. Quiquerez writes in a most mysteriously jubilant manner informing the editor of the *Moniteur* that he has made a discovery in dry-plate potography. Though, he says, there is nothing new in his mode of operating, the preservative he uses gives the most rapid results, the film, at the same time, being firm and not liable to break or stain. So far all is well; but why not publish the matter at once without attempting to excite curiosity which, in nine out of ten such cases, is disappointed.

There are at the present time open in Paris two exhibitions in which photography plays a part, viz., the exhibition of the *Industries Maritimes et Fluviales* in the Champs-Elysées, and that of the Geographical Society at the Tuileries. In the former the photographic department is situated at the north-east angle of the building, on the first floor. In spite of the efforts of M. Moulin, who has charge of the department, many exhibitors have not yet sent in their frames, and the *tout ensemble* of the exhibition is marred by the blank spaces on the walls. Amongst the exhibitors are MM. Leon Vidal, Lumière, Thiel, Bernoud, Levy, Girard, Gougenheim and Forest, Mandar, and Delarche. We shall be enabled to give a better description of the affair when the exhibition is complete and the catalogue published. The same may be said in connection with the photographic section of the Geographical Society's exhibition; for, though it includes numerous most interesting collections of photographs, it is with the greatest difficulty they can be found by those not specially acquainted with the place.

Dr. Van Monckhoven has just published, under the title of a *History of Photography in Carbon*, a work consisting of a complete *résumé* of the newest methods of the present day. We are glad to see that the critics speak favourably of the work.

## RAMBLES AND RECOLLECTIONS OF AN AMATEUR PHOTOGRAPHER.

"In somer, when the shaws be sheyn,
And leaves be large and long,
Hit is full mery in fayre forest,
* * * *"
—*A lytell geste of Robin Hood.*

Remembering what Mr. Frank Howard, in a happily-written paper, had said of the agreeable recollections to be evoked by an examination of one's old negatives, and thinking that, possibly, a narrative of personal experiences might interest others than "the sympathetic friend at one's elbow" of whom he speaks, I was induced, when some editorial remarks appeared *On Camping Out*, to offer to string together some jottings (unless in the meantime some one more competent than myself should do so), which offer our Editors were pleased to accept.

In the year 1853, being then resident in London, I felt a strong inclination to take up photography as an amusement when an opportunity should occur, doubtless attracted by such specimens as I had seen. "The whole art of photography on paper and glass" was at that time being taught in the school of the Polytechnic Institution, under the direction of Mr. Malone and Mr. Pepper, the fee for the course of nine lessons being seven guineas! I did not avail myself of the instruction thus afforded, probably thinking that the money would be useful for apparatus, but I invested eighteen-pence in a handbook published by Mr. C. W. Collins, and this was the first treatise on photography which came under my notice. The commencement of the following year found me in the country, and more at liberty to carry out my wishes. The back numbers of the *Journal of the Photographic Society* (then a fine nine-months' child) were purchased and, being from the circumstances of the case more interesting than any journal can now well be, eagerly studied, and operations were commenced, though not at first with collodion. Hunt's *Manual* and his *Researches on Light* furnished plenty of processes for experimenting with, the chromatype being a favourite for copies of engravings by contact. The catalisotype—a self-developing negative process in which iodide of iron played a part—was

also occasionally tried, but my initiation into the mysteries of collodion was not long delayed. "Burning-in," popularly supposed to be practised on a newly-inducted freemason, was at that time unknown in connection with photography, so I did not undergo any very terrifying ordeal. The priest of Apollo—by profession, appropriately, a gilder—poured an ethereal fluid on to a glass plate, which he then immersed in a trough of liquid, and, having exposed the plate in the camera, squeezed himself and me into a small kitchen cupboard, and proceeded, by what seemed magic, to bring out the invisible image. The resulting glass positive is before me as I write, and would not lightly be parted with.

A camera from Griffin and a half-plate double combination lens from Goddard were purchased, and some portraits of friends taken. Goddard's lenses, and even his name, are probably unknown to many photographers of the present day. His long-focus double combination and his landscape lenses were excellent instruments, and his periscopic, one of the earliest of the wide-angle series, proved very serviceable to me a few years later in the Vale of Neath. Hardwich's *Chemistry* (the first edition appearing in 1855) was a welcome aid to those who, like myself, were groping partly in the dark; for in those earlier days of collodion everything was not ready cut and dried for use as at present, and much time was spent in making soluble cotton and in chemical experiments rather than in taking pictures.

Wishing that my recreation should be taken out of doors, and my taste inclining to landscape, an Archer's camera was purchased in 1856, and some pictures taken by means of it; but the combination of camera and developing-box in one instrument was occasionally very inconvenient when the best point of sight was one in which it was difficult to manipulate. Comfort and chances of success are largely increased when the tent is pitched in a cool place under the shadow of a tree, and a little extra weight may well be tolerated if these desirable ends are secured. Operating in the vicinity of a town and in the presence of strange people was at first nervous work, and many odd questions were put to one. Occasionally, too, one's diffidence received somewhat of a shock as, when coming up a back street with a companion, and with the stand, &c., neatly done up in shiny cases, we were greeted by the youngsters with the cry of—"Here's the band!" However, I quickly became pachydermatous. Thanks to Mr. Hennah's work, *The Collodion Process*, I soon began to get better negatives than I had hitherto obtained.

The year 1857 comes before my recollection on account of the Art Treasures' Exhibition at Manchester, including a large show of photographs collected and arranged by Mr. P. H. Delamotte, and numbering nearly 600. It consisted principally of portraits of all the leading men of the day by Claudet, Watkins, Caldesi, Bingham, Lake Price, T. R. Williams, Maull and Co., Howlett, and Mayall. There were, likewise, figure subjects by Rejlander, Lake Price, and Grundy; landscapes by Fenton, F. Bedford, Llewellyn, H. White, B. B. Turner, and Dr. Holden; and a frame of portraits of the insane by Dr. Diamond. Rejlander's *Two Ways of Life* had, for some reason, unfortunately been removed from its place, and I had to wait till a later period for the pleasure of seeing it. I must own that the glory of the water-colour gallery has in great part effaced my memories of the photographs. Scott Archer—the introducer of the collodion process, who is spoken of as a most intelligent and ingenious man by a friend who had often worked with him—died in this year; and of the names above mentioned many are, alas! now missing from the roll-call of photographers, among them being Mr. Fenton, whose exhibition of Crimean photographs in London in 1855, and afterwards in the provinces, largely assisted in drawing public attention to photography. Another missing name is that of Mr. Gutch, the author of the well-known *Scientific Register and Almanac*, who published some illustrations to *The Sketcher* of the Rev. John Eagles, and a large series of views (obtained with Archer's camera) of the scenery of Devonshire, Somersetshire, and other counties.

My first expedition to any distance from home was to Raglan, in company with one who has since risen to eminence in the landscape branch of our art, and whose star then gave promise of being in the ascendant. On the journey I received a caution as to the impolicy of carrying all one's eggs in one basket, which has not been forgotten. My own baggage for $8\frac{1}{2} \times 6\frac{1}{2}$ pictures was of modest size; but my companion, who was working $14 \times 12$ plates, necessarily had something bulky with him, and the whole of his kit was placed in a gigantic chest mounted on two small wheels. At Newport it was necessary that we should change from the South Wales line to the Monmouthshire, and with some difficulty the weighty mass was carried up the long flight of steps at the Mill-street station and on to the platform; but by no persuasion could it be got into the luggage-van, which had a somewhat narrow door, and we were obliged to wait for the next train, when an open truck was attached. On reaching Raglan-road it was got by dint of a little labour over a rather rough road to the castle. Having an introduction to the warden we luckily had a room in one of the towers placed at our service. This, by the aid of yellow calico, was made suitable, and as soon as our things were ready we set to work with a good will. We were tremendously energetic—starting from the "Beaufort Arms" at six a.m. for the castle, having breakfast sent to us there, and sticking to work as long as the light served in the evening. It would now be difficult to get me to go through the same amount of labour; but my then companion still occasionally does twice as much in a day as he ought to do, and suffers in health in consequence. I was at that time using a nitrate bath with a minute quantity of *nitrate* of silver added to it, and the developer with acetate of soda, which had just been recommended by Mr. Hardwich, and obtained excellent results. Some months later a sagacious individual of the type described some time ago by Dr. Nicol was advertising a powder for adding to the developer to confer density, and furnished a quantity of about three drachms for half-a-crown. A little of it was put into my hands by a person who had been rash enough to invest, and an examination proved it to be nothing but equal parts of powdered acetate of soda and loaf sugar. I plead guilty to having taken a malicious pleasure in publishing its composition and stopping his "little game," which was done without mentioning any names. Mr. F. Bedford's "battery" arrived at the "Beaufort" on the day we were leaving Raglan, but he was not visible. I afterwards regretted that when at Newport I did not visit the place where

"The blameless king
Held court at old Caerleon upon Usk."

Another expedition, some two years later, was to the Vale of Neath, in company with two friends, one of whom was a photographer. We did not reach Neath till past midnight, but luckily obtained beds at the "Castle Hotel," and were much amused at finding the bed-curtains made of yellow tammy—most fit material for enveloping us. The sight of the glow-worms, in thousands, on the banks of the railway was some compensation for the tedious delay in travelling. In the morning we proceeded by rail up the valley, and were soon eagerly scanning the beautiful prospects which opened out on either side. Alighting at Glyn Neath we made our way on foot to Pont Neath Vaughan, some two miles further up the valley, which was to be the base of our operations, and had our apparatus and luggage brought from the station. The scenery for miles round was very picturesque, abounding in waterfalls on the various streams which unite near the village, and, though not so bold and rugged as that of North Wales, rocky and beautifully wooded. We spent a delightful week amongst it. I worked in a cheap and efficient tent then recently introduced by Mr. Leake, and which did good service till something larger was required. A facetious friend having denominated it the "dinner tray," from its resemblance in shape to that useful article, it was usually known among us by that name. A cart conveyed our apparatus to many selected spots, and the tramway running by the side of the Neath river was available for some distance. We found it occasionally necessary to be wary of the large black ants which swarmed in myriads in some parts, and whose hillocks were at least three feet high.

Our quarters at the small inn proved very comfortable, and we had the pleasure of being waited on by the landlord's pretty daughter, of whom a good water-colour sketch, by an artist who had stayed at the house, hung in our sitting-room. She was the cause of a little playful jealousy among us, and the married man of the party was threatened with exposure on his return home for his base conduct in interfering. We had none of us reached the age of wisdom described by Thackeray, when

"The reddest lips that ever have kissed,
The brightest eyes that ever have shone,
May pray and whisper, and we not list,
Or look away, and never be missed,
Ere yet ever a month is gone."

We quitted the happy valley regretfully, and as we journeyed homeward the married man recollected with dismay (a punishment for his sins) that he had left in the soap dish of his bedroom a lump of cyanide of potassium which he had used to clean his hands, and was fearful lest any harm should arise from it. He was pacified by the suggestion that our mysterious operations were probably regarded with a degree of awe, and that a relic of that kind would be at once thrown away. Fortunately this thoughtless act entailed no disastrous consequences. One of our boxes, through being carelessly placed by a porter close to the edge of the platform, was thrown down on to the rails, but less damage was done than might have been anticipated.

A photograph before me, with the date "June 1, 1860," upon it, brings to mind a pleasant day on board a friend's small steamer, the cabin being used as our manipulating room. A picturesque old castle on the river's bank was fired at by the great gun of the party; but his porcelain bath coming to grief a few minutes later he was thrown out for the remainder of the day. An old fishing-boat and nets furnished a couple of good pictures. Our entertainer secured a picture of some sheep, remarking that he must only show it a bit at a time to his brother, a landscape painter, lest it should unduly excite him. As the sheep were distant, and therefore small, the extreme caution was scarcely necessary.

Like, probably, many photographers who have worked much out of doors, I have occasionally met with odd adventures. On one occasion, while developing a plate in my Edwards's tent, which was placed near the towing-path of a river, I heard a great scuffling, occasionally in unpleasant proximity to me, followed by a rough voice calling—"You must come out of that there, for I can't get the horse past!" I emerged as quickly as possible, and found that it was an open question whether the tent would be knocked over or the horse go into the river. Even-

tually, by slightly shifting the tent and covering the yellow calico window with the focussing-cloth, the animal was induced to go on. Another time, on returning to my tent, from which I had been away about a quarter of an hour, I was astonished to find the cover (luckily, a loose one) off the box and fire smouldering through it, my hired porter looking on in a state of bewilderment. The gallon of water I had in a can was insufficient, and any further supply was some distance away, so, as the fire could not be stamped out, I was obliged to kick the cover to a bare piece of ground, where it could do no harm. As my gentleman smelt strongly of tobacco I believe he must have seated himself on the chemical box for a quiet smoke as soon as my back was turned, and dropped his match on the portion of cover lying on the ground; but this he would not acknowledge. The idea of a man rushing back to develope a picture which should make his reputation and finding his tent gone struck me as being so ludicrous that I really felt no anger.

I had been experimenting with dry plates for some time previously, and this occurrence materially assisted in determining me to abandon the wet process for outdoor work. The increased freedom of movement, the possibility of obtaining pictures where "wet" apparatus could not be taken, and the absence of all worry, make dry-plate photography the most delightful of hobbies, and certainly some of the best and most artistic work which has been exhibited was by "dry" men. This is, of course, an amateur's view; but, seeing the immense convenience which dry plates would often be to professional photographers, I cannot understand, in the face of what has been done, their apathy in the matter.

The tannin process giving me good results my camera became a much more frequent companion than formerly, and many bits of scenery were secured which still afford me pleasure to look at. In 1865, having prepared a dozen and a-half of tannin plates, I started alone for Bettws-y-Coed, and located myself at that well-known artists' hostelry, "The Oak." I found there a gentleman whose paintings have regularly for some years adorned the walls of the Academy, with whom I was fortunately acquainted, and two amateur sketchers who knew my own neighbourhood arriving on the next day, I soon felt as if not among strangers. During my stay I saw none of that jealousy and dislike of photography among the many artists there assembled which have been attributed to them as a body; on the contrary, they did me many kind offices. Hamerton, in his *Painters' Camp*, makes many truthful observations respecting photography, but is severe with regard to its soullessness, as if the lens and camera (though not such pliable instruments) did not stand in the same relation to the photographer as his brushes and palette to the painter. With the existence of artistic work like that of Mr. Robinson, Mr. R. Manners Gordon, Mr. H. Cooper, and others who might be named, such remarks only raise a smile, and might now well be omitted. I have seen photographs which, in my humble opinion, excel in treatment of light and shade and in feeling anything which it has been my fortune to notice by Mr. Hamerton, who, indeed, is by many considered to be more facile with pen than pencil.

I finished up my plates on the last day of my visit, and found, on my return home, that I had secured sixteen pictures, the other two being under-exposed. Unfortunately about one-half of these negatives are no longer available, having been protected (?) with a varnish which in a few years caused them to crack all over. The maker suggested many ingenious reasons for the misfortune—such as the negative not being thoroughly dry when varnished, some of the fixing solution being left on the film, &c.—but the fact of the other negatives remaining good which were done under the same conditions, only coated with another varnish, pointed pretty clearly to where the fault lay.

Business avocations pressing more heavily on me during the last few years I have, unwillingly, been compelled to give up the preparation of my own dry plates, but have found efficient substitutes in those of Dr. Hill Norris, Colonel Wortley, and the Liverpool Dry Plate Company. Dr. Norris's "rapid" do not keep long when once the package is opened, orange stains appearing at the edges; but when fresh, and used with the iron developer recommended some time since by Mr. Dawson, they leave nothing to be desired. The other two seem to retain their sensitiveness and good properties for an indefinite time.

Many have been my rambles, camera in hand, by the side of "lucid Avon," and where Sabrina is sitting "under the cool, translucent wave," and one day of a visit to London in spring or summer is usually devoted to old Father Thames, some miles of whose banks are known to me from these wanderings; but on one occasion my career stood a chance of being cut short by my coming suddenly against some rifle-butts at which firing was going on, while I was taking a near way a little above Cookham. Epping Forest, too, has been visited, but it must be owned with a feeling of disappointment. Many more recollections might be called up, but it is time to cry "Hold! enough!"

In conclusion: I would, from the experience of twenty years, say to any one in want of a rational amusement—"Read the editorial remarks *On Hobbies*, at page 27 of the Journal for this year, purchase a portable camera with two double backs for plates not larger than 8 × 5 inches, get one of the several forms of rapid, non-distorting lenses, and 'go in' for dry-plate photography. Your decision in accordance with this suggestion will never be regretted." H. W.

## CULLINGS

### From the Sixth Convention of the National Photographic Association of the United States.

In these "cullings" we shall present, mostly in their own language, the observations made by the respective speakers on such of the leading topics of the day as were presented for interchange of opinion.

Pictures, and How to Make Them.—Mr. Hough observed:—I think that a knowledge of what a picture is should come before the knowledge of how to make it. It seems to me all our talk and all our education is taken out before the artistic part. I think if we all had an artistic education, and knew what a picture was before we undertook to make it, it would be better for us and our customers; and those who come after us, who intend to learn the business, should be taught first what a picture is, and then how to make it. And this has been the great trouble—that we have first learned gradually and with difficulty the process of making the picture before we knew what we wanted to get—that is, before we well knew, had a full knowledge, or were fully able to criticise a picture ourselves; and that one point alone would make a vast difference in those who come after us, and relieve them of very much trouble in the difficult position we now occupy in making a picture. There are in all faces certain characteristics that individualise them and make them known as individuals, differing from all others. Indeed, unless there were certain characteristics that make them unlike all others in the world there would be the greatest confusion. There is an ideal face, and if we try to make a beautiful picture of every face we must have this ideal in view; that is, we must know what outlines, what forms and outlines, would make a perfect face according to our ideal, and would conform to this individuality. If we do not bring that out we lose the individuality of the likeness. If we exaggerate the individuality we produce a caricature. That is the way caricatures are produced—by exaggerating the individual peculiarities. These things are no more than caricatures; they exaggerate. They are usually known. They present individual characteristics in the strongest lights. That is not always what we want—at least if we seek to make the most beautiful forms. I think if these ideas were kept in view by photographers—to first gain a knowledge of what an ideal face is, its true and perfect form, and then seek such a view of their customers' faces as would come close to that, they would be more likely to get pleasing pictures. If they went too far they would lose the individuality. It is between these two they have to study to get the best effects.

The Position of the Camera.—Mr. Carlisle said:—One of the speakers has presented the subject here of the position of the camera. He has given us his ideas of lateral motion, and referred to the idea that there is a great deal of importance in the other motion. I find great advantage sometimes in changing the elevation of the sitter. We find, in making it (the picture), the object is to bring the point above or to bring the point below where it belongs. I have seen a person in a different position produce different results. This, of course, will depend upon the length of neck and position of shoulder, quite as much as on the contour of the head, of the party you are about to please with a picture. You must also recognise outline and profile, and give each sitter the proper length of neck. The way to do this is to have the camera not confined, but sometimes in one position and sometimes in another.

Secret Processes.—Mr. Bowdish:—Amongst photographers there should be no secrets. This is a National Association, and among its members as such there should be no secrets. Now, the dignity of photography, it seems to me, depends upon the National Photographic Association, as it inclines us for the formation of a good education in the masses of those in this country in photography. Now, I say, if my next-door neighbour is my most successful rival, and comes to me for any knowledge that I may possess that he does not, he is welcome to get it; and I say there should be no other feeling in this Association. No man should hitch the trade-mark of this Association to his cards with the idea that it is going to elevate him, unless he does something worthy of being a member; he should look at it from another point—that if he make a poor picture he is not only degrading himself, his art, but every member of the National Photographic Association that is associated with him. These are the ideas that I wish to suggest, and which may be got up with very little money. There should be no contention except that noble contention of those who excel in work; there should be no secrets. There are a few other points that I wish to allude to. One is that of sitting customers many times, so as to get an absolutely perfect negative. I find in my experience sometimes that, in doing this, we get a very poor expression. I think that the very first point is to get a pleasing expression in the picture; without that the most perfect work goes for nothing. So I think we should endeavour in every way to attain this object. This should be done with as few sittings as possible. Retouching the negative has been carried to excess, and I find it very difficult to meet what might be called artistic retouchers. They do not retain the likeness in retouching the negative. I have succeeded in getting some very smooth retouchers, who would build up a picture so as to bring out the most pleasing effects in the picture without doing that too much. I would say that I am very much pleased to be with you all here today. I have been well repaid for coming so far in the beautiful examples of pictures shown below.

# Correspondence.

The Photographic Society of France:—Cordial Welcome to Two Foreigners.—Preservation of Positive Paper.—Proofs by M. Bernard.—M. Carlos Relvas and Jacobi's Collotypic Process.—M. Liebert's Apparatus for Cutting and Printing by the Carbon Process.—M. Schaeffner's Medulline Collodion.—M. Dubroni's Dry-Plate Camera.—Experiments on Toughened Glass by M. de la Bastie.—M. Despaquis' Collotypic Process.

The usual monthly meeting of the Photographic Society of France was held on Friday last, the 6th instant,—M. Davanne in the chair.

Before entering on the ordinary business of the meeting the Chairman, in a few and appropriate words, gave a cordial welcome, in the name of the Society, to two foreign gentlemen who were present—Captain Abney and M. Rodriguez. As to the former gentleman it is not necessary to introduce him to the readers of The British Journal of Photography, he being well known to them in connection with photographic science, a successful operator, and whose *savoir* has enabled him to carry out with honour many scientific missions entrusted to him. M. Rodriguez is a native of Portugal—a country which was a few years back far in the rear of other European nations in photographic science. Thanks to the patriotism and energy of a few, of whom the last-mentioned gentleman stands foremost, that country is now in a position to be envied by its turbulent and less happy neighbour.

M. Rodriguez exhibited a collection of proofs in fatty inks, which were very much admired. He then gave a short description of the process he employs, which was listened to with great interest.

M. Carrier forwarded to the Society a chemical preparation for the preservation of positive printing paper (chloride of silver). Captain Abney rendered justice to the merits of this paper by saying that he had employed it for many years with great success.

M. Bernard sent some very remarkable specimens of photographic proofs for inspection, which were much admired.

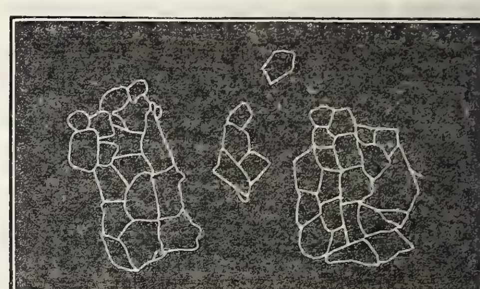
M. Carlos Relvas, the celebrated amateur photographer, presented to the Society some magnificent proofs printed by M. Jacobi's collotypic process, which process M. Carlos Relvas has purchased from the inventor in order to bestow the invention on his country. M. Carlos Relvas, happily blessed with a great fortune, spares no expense or pains to advance an art to which he has devoted himself and his wealth. Let us hope that his example will be followed by many; for the art of photography possesses in itself an inexhaustible source of pleasure, as the more we penetrate into its secrets the more enticing it becomes. Not only do its votaries derive the pleasure accompanying every new discovery, but, what is more elevated, they heighten not only the *prestige* of their country but bring happiness into the midst of hundreds of families.

M. Liebert then laid before the members a number of carbon prints. He informed them that this process had completely replaced the old one with silver salts in his establishment. He then exhibited a very ingenious cameo mask printing-frame he had invented to facilitate the printing and tinting of such proofs. It is composed of a wooden box about a yard in length, eight inches in breadth, and three or four inches in depth. This box is divided in three (lengthways). No. 1, having a plate glass bottom, is divided into ten or twelve divisions, of the exact size of a *carte de visite*. In these spaces are placed the negatives to be printed, over which box No. 2, containing a series of twelve cameo screens, is lowered. Box No. 3 is now put into its place, and the carbon tissue is then put into its place, and twelve small trap-doors are let down. The lid, furnished with springs, is then lowered, and the proofs are ready for exposure. An actinometer is now brought into use, and when the exposure is judged to be sufficient the frame is taken into the dark room and box No. 2 taken out, and another box containing other cameo screens takes its place with mathematical precision. This is done to print the fancy border, with the address of the studio, &c. M. Liebert informed the Society that the greatest difficulty was to obtain the carbon paper cut to the exact size and always of the same shape. He had overcome that impediment by a machine with which he could cut up rapidly, and with great precision, the necessary quantity. His apparatus consists of a large square board in which is imbedded a sheet of plate glass; the frame projects about an inch above the glass, and round it, at equal distances, are holes or notches made to hold the steel rulers, which at first are placed the length of a *carte de visite* apart. A knife is now drawn along each rule and several bands of paper are cut. The steel rulers are now placed crossways the width of a *carte de visite* apart; the knife is then drawn along, which divides the paper into pieces of the exact size to fit under the trap-doors of the printing-press. M. Liebert informed the Society that 500 could be printed daily, that he manufactured his own paper, and invited the members to make a visit to his studio, where they could see and judge for themselves of the value of, and ease in, the manipulations of the carbon process.

M. Schaeffner, the well-known chemical manufacturer, offered to the members present some samples of his newly-prepared medulline collodion. The medulline, or elder pith, possesses all the chemical properties of cellulose in a pure state. Collodion made from it is superior to any other for photographic purposes, and the great hindrance to its general use is the difficulty in its preparation, as it becomes horny and, therefore, difficult to dissolve after having been under the chemical influence of the nitrate of potash, &c. M. Schaeffner says that he has overcome this difficulty. He told the members that he had discovered a method of preparing it by which he could obtain at the same time a collodion very limpid and unalterable, having a maximum of sensibility and density, and although the value of medulline is ten times more than cotton, he was enabled to sell his collodion at a price very little higher than that made with pyroxyline.

M. Nicolle (Dubroni) presented a pretty little apparatus for dry-plate work. This gentleman has been always bent upon making photography agreeable and instructive to all, and has succeeded in rendering great service to science by giving tyros a taste for chemical manipulations and photographic excursions; in fact, we might truly call his establishment a hot-house for amateurs.

M. de la Bastie then began to experiment upon the newly-invented system of toughening glass. Firstly, a number of small glass saucers were thrown on the ground without being broken. Secondly, a piece of plate glass, three-sixteenths of an inch thick, was laid upon two pieces of wood, so that the glass formed a bridge; weights were then allowed to fall from the ceiling upon the plate glass without its being broken. Thirdly, a common lamp glass was heated by a Bunsen burner on one of its sides until it became quite hot, and was then plunged into cold water without breaking. Fourthly, a glass saucepan was then placed on a fire and water boiled in it; afterwards it fell upon the floor without cracking. M. de la Bastie, wishing to show the members what a curious phenomenon took place when toughened glass was broken, asked for a hammer, and, after having laid a piece of plate glass three-sixteenths of an inch thick and of about the size of a school-boy's slate on two pieces of wood, as in the first experiment, he struck it several times with the hammer without its breaking; at last it flew into a thousand pieces (here the expression is correct) all round the room, and, if I may be permitted to use the simile, it resembled a cast net at the moment of being thrown from the shoulder of a fisherman into the river, flying, as it did, in the form of rays, attaining, as it were, velocity from the centre, and honeycombed from one extremity to the other. I picked up two of the largest fragments, of which I forward the exact design—



These two samples were upon the table; as to what fell upon the floor every piece was single. The edges are not sharp and cutting, as in ordinary glass. Will this invention render service to photography?—that is the question. I think so; for, if it can only supply us with thin, unbreakable glass trays to replace the heavy china or earthenware ones, it will be an advantage which will be welcomed by many. But other things may be hoped for; M. de la Bastie told us that, ere long, all our cooking apparatus could be made with glass. This is, indeed, to be welcomed; we should not then fear being poisoned by a careless servant. Whether or not this invention will prove of use in the manufacture of photographic lenses remains to be proved. This glass can receive a high polish, but can only be cut under certain conditions. As to its cost, M. de la Bastie said that would not be a hindrance to its general use, as it would not be more than thirty per cent. above the

usual price. That the company should make more haste in their fabrication is the desire of all.

The meeting of the Society was adjourned until November next.

M. Despaquis sent me for publication a reply to the leading article in The British Journal of Photography of July 23 on his new collotypic process, which reply I have forwarded to the Editors.* I cannot enter into a discussion on the value or merits of his patent. I can only say that by the kindness of MM. Lemercier and Co. I was permitted to visit their establishment, in which I saw the Albertype process and the same process as modified according to the idea of M. Despaquis. There is certainly a marked difference between the appearance of the two layers—that formed according to the process of Herr Albert being in relief, whereas that modified by being solarised agreeably with M. Despaquis' plan was perfectly level, without relief, having a polished appearance. Is this an advantage? M. Despaquis says it is, and gives the following reasons:—1. There being no relief the water from the sponge cannot lie in the hollow parts; no "dabbers" are, therefore, required, and the proof gains in sharpness and beauty. 2. The long exposure from the back, after the formation of the image, renders the film completely insoluble, and, consequently, an unlimited number of proofs can be printed.

I have received many letters inquiring whether it is absolutely necessary to purchase a license from Herr Albert before M. Despaquis' process can be worked. M. Despaquis says that such is not the case; for a pellicle of gelatine can be employed, separated from glass, and attached afterwards to wood or stone, or, what is better, to linen bands or straps passing over the drum of the printing-press. E. Stebbing, *Prof.*

3, *Place Bréda, Paris, August* 10, 1875.

* This we have delayed publishing for a week, M. Despaquis, at the time of writing, not having seen our second article on his process.—Eds.

## BLISTERS ON PRINTS.

*To the* Editors.

Gentlemen,—I see by the Journal for July 16 that English photographers are troubled with blisters.

I have found that the immersion of the prints in a very strong solution of salt after fixing will always cure the trouble in single albumen paper. The prints should be left in for ten minutes, then put under the tap, and the water let on for a few moments to gradually weaken the strength of the salt before changing the water entirely.

For double albumenised paper immerse in alcohol, after toning, until the prints show that it has evenly and completely penetrated the paper; then fix and wash as usual; no blisters will arise. The alcohol can be used over again any number of times, occasionally strengthening it with fresh alcohol.—I am, yours, &c., A. Marshall.

147, *Tremont-street, Boston, Mass., U.S.A., July* 26, 1875.

## THE WOTHLYTYPE PROCESS.

*To the* Editors.

Gentlemen,—The "Peripatetic Photographer" attacks me on a new point.

But in answer to his question why I have given up Wothlytype printing, I beg to say I have not. All my choicest work is printed by this process, and probably always will be. There is no pyroxyline made very suitable for the process, and no good arrowroot paper in commerce, which may account for its disuse.—I am, yours, &c.,

H. Stuart Wortley.

## "RIVAL PRINT BURNISHERS."

*To the* Editors.

Gentlemen,—In your Journal of the 9th inst. I notice an article on *Rival Print Burnishers*, containing a copy of a communication from W. G. Entrekin claiming the "sole control" of the "burnisher patents in the United States."

Now, not acknowledging this as a fact, I fail entirely to see what connection this can have with the controversy in England. Entrekin has *no patent whatever in England*, and his advertisements to that effect are deceptive and false. His American patent bears date December 3, 1873, whereas Weston's English patent is dated September 10, 1872—over a year previous to this Entrekin's American patent for his so-called improvement. As it is unnecessary to tell you, no valid patent covering the same devices could have been issued to him in England. His course in this country has been one of ceaseless endeavour to trump up something to invalidate the Weston patents, but, thus far, without success.

In a recent interference case instituted by Weston a portion of this Entrekin patent has been rendered valueless to him, and a patent issued to Weston for the device, Weston being the original inventor. Still more recently an interference was instituted by one Calvin H. Buckwalter, an operator and agent for this same Entrekin, with a view to break down the Weston patents. This case was decided in Weston's favour by the Examiner of Interferences and by the Board of Examiners in Chief, and also by the Commissioner—the court of last resort, as it was. The decision of the Board distinctly expressed the opinion that the whole case was a fraud, and that a portion at least of the evidence introduced in behalf of Buckwalter was manufactured for the occasion.

Now, there being no English patent of Entrekin's to contest, and he having failed thus far in his efforts to break down the Weston patents here, it hardly seems to me to be necessary to appeal to the English courts for the purpose of settling the matter. I shall, however, make such appeal shortly, for the purpose, not of establishing my rights—for I have all the rights there are in the matter thus far—but to collect from infringers the royalties to which I am entitled under my patents.

A friendly arrangement might have been possible had the parties been in a position to contribute anything to the success of the business. As it is, any concession from the owners of the Weston patents would be in the nature of a premium for dishonesty and a reward for infringement.

Dealers in photographic stock and photographers should know that the courts will make short work with frauds; and also, if they will consult the records of the English Patent Office, they will find that Weston is the original patentee, and his patent granted according to law.—I am, yours, &c., J. P. Bass.

*Bangor, Me., U.S.A., July* 20, 1875.

## THE LAMBERTYPE PATENT.

*To the* Editors.

Gentlemen,—I have been rather amused at the letters which have lately appeared on the methods of making and working up negatives adopted by Mr. Croughton and by M. Lambert.

I happened to be a visitor at the South London Photographic Society's meeting when Mr. Croughton exhibited his method of producing enlargments in November, 1873, and must say that I was far from being prepossessed by either the pictures he showed or the method he had adopted. I bought Mr. Edwards's method, and was satisfied that it was the best plan then used. I have, however, since worked out and used a method of my own; but as I am always open to real improvements I called to see M. Lambert's pictures, and after a careful scrutiny I was obliged to confess that he had a power of producing artistic effects not hitherto shown in the works of any of your correspondents, with all of whose work I am well acquainted.

If Mr. Croughton and the admirers of his way of working with his papers and soft crayons are satisfied with their method I, for one, should not desire to stop them from using it; but, as I have seen both Mr. Croughton and M. Lambert work the whole negative up, I think I may be allowed to offer an opinion, and that is that M. Lambert's work and system are as different as possible from Mr. Croughton's, although both of them use paper to cover their negatives and both use pencils and stumps—possibly both get their materials from the same shop.

My advice to my brethren in the art is to go and see the specimens M. Lambert shows, and also the work of your various correspondents who have attacked M. Lambert, compare results, and, in common honesty, declare it. I have practised the carbon process and gave it up because I could not get results equal to silver prints; but I defy anyone to produce in silver anything equal to M. Lambert's chromotypes. Mr. Fry in his letter admits he has failed with the carbon process and has returned to silver printing; so, of course, as an honest man, he will not wish to rob M. Lambert of his process for making permanent printing a commercial success.—I am, yours, &c., Arthur Maddison.

*Huntingdon, August* 9, 1875.

*To the* Editors.

Gentlemen,—Since the discussion has arisen between Mr. G. Croughton and his friends and M. Lambert I have had the curiosity of looking up what Mr. Croughton really has published. Possibly Mr. Croughton may have taught his pupils his method of working on tissue-paper in front of enlarged negatives, and he may have described it to his friends, but this is not publication in the legal sense so that the public may have the benefit of it. I have, therefore, examined his paper read before the South London Photographic Society in Dec., 1873.

The process he then described is very interesting; he did not claim any novelty in it, nor was there any. There was no originality in placing tissue-paper on the back of a negative and working on it. Neither was there any novelty in placing paper between the negative and the print to produce a sort of softness. This was done in the old calotype days. Thin and thick paper, mica, sheets of gelatine, and even thin glass had been used for the same purpose. On this occasion Mr. Croughton certainly said he used tissue-paper in front of his enlarged negatives; but no words can be more clearly expressed as to why he used it. He says, in the course of the paper:—"In elderly people the lines and texture of the face is far too marked in the enlarged negative; this can be much softened and reduced by printing through tracing-paper. Strain the tracing-paper over the face of the negative, so inter-

posing a thickness of tracing-paper between the sensitive paper and the negative."

Nothing can be more precise than this; the tissue-paper was placed between the negative and the sensitive paper to soften and reduce "the hard lines and texture of the face." No other reason is given why this paper is so interposed, except the sufficient one—to reduce and soften hard lines and texture. Still further to support and confirm this he says that he also puts tracing-paper on the back "to soften the printing;" but he here assigns an additional reason why he puts it on the back—because "it is a capital medium for working with the pencil to strengthen the high lights." Being a clever retoucher he could work on the front of the negative, but the back being bare glass he could not work on it; so, in addition to using the tracing-paper at the back for softening the printing, he also uses it for working on with the pencil. His exact words are:—"I always strain tracing-paper on the reversed side of the negative, as it serves to soften the printing and is a capital medium to strengthen the high lights." Then he describes how, by a solution of Canada balsam in benzole, he strengthens the shadows of the drapery, together with other interesting details; but not one word does he say about using the front tracing-paper for working on by the pencil. The purpose of the front tracing-paper is only for softening the printing.

As Mr. Croughton, all through his long and interesting paper, is so careful in giving full details of all he does, and as he is evidently anxious to honestly make a clean breast of his process, it is remarkable that he should omit this one thing which would have been a novelty. The great point of his paper is to show the invaluable importance of obtaining a good transparency for enlarging. He discards all touching on the original negative and does as little as possible on the enlarged negative, *working on it only on the back;* but on the transparency he concentrates all his attention, and does his chief work on it. His remarks on this subject are of the greatest value and would well repay reprinting.

But so far from anticipating M. Lambert, judging by the accounts published, I know of no two men's mode of producing enlargements that are so unlike. M. Lambert's method seems to be not at all to work on the transparency, but to devote his attention entirely to the enlarged negative. This, it seems, he builds up by working with pencil and stump on *both* sides of the negative. As an illustration, notice what Mr. Croughton says in another part of his paper, in referring to an enlarged negative he showed, and contrast that with the description given of one of M. Lambert's loaded with blacklead powder on both sides:—"The enlarged negative, you will see, is *untouched,* except that the stray locks of hair are defined and pinholes and dust-spots filled up, and the high lights throughout on tracing-paper *at the back.*" The italics are mine, to show the distinction and to mark more clearly that Mr. Croughton's method, in his own words, is not that of working on the tracing-paper *in the front,* which is the point in dispute.

I find that the discussion of Mr. Croughton's paper was postponed to the January meeting of the South London Photographic Society, when Mr. Edwards opened it with a paper in which he denied the merit of some parts of Mr. Croughton's method as compared with his own. An animated discussion arose, which is lengthily reported, during which Mr. Croughton took an active part, giving further details of his process; and although much was said on touching on the original negative, on the enlarged one, and on the transparency, not one word was said about touching on the tissue-paper in front of the enlarged negative. Both Mr. Edwards and Mr. Croughton acknowledged to touching on the paper on the back, but neither of them said a word about the paper on the front. They both seemed agreed as to the usefulness of "softening" in the printing; but, as described, Mr. Croughton's was by interposing tissue-paper, whereas Mr. Edwards adopted the American plan of separating the print and the negative a small distance during a short period of the printing.

I find, further, that in a contemporary journal a long article was published by the editor on the whole subject, and, although he commented on the details of the papers and the discussions, he said no word on the subject in dispute. Had it cropped up he would certainly have noticed it as a novelty, especially as he distinctly pointed it out and commented on it when, in Paris, he saw M. Lambert working on the paper front of the negative.

It is not my purpose to say a word against Mr. Croughton or his process. I think it a most valuable one; but it certainly is quite different from the descriptions given of M. Lambert's. From a calm and dispassionate review of Mr. Croughton's paper, the discussion, and the editorial comments, I cannot discover the least foundation for the statement that Mr. Croughton worked on the tracing-paper in front of the enlarged negative, but all the evidence shows exactly the contrary. I therefore think that Mr. Croughton and his friends are mistaken when they state that Mr. Croughton published a method of working up negatives by touching on the paper in the front.—I am, yours, &c.,

*August* 10, 1875. CRAYON.

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*To the* EDITORS.

GENTLEMEN,—I had been forewarned that I would create a great deal of jealousy amongst a certain class of anti-improvement photographers—always ready to play the professor, but never willing to learn—if I dared to introduce processes giving better results than their own; but the persistency with which they obtrude new misstatements and misrepresentations as soon as I have disposed of the old ones almost surpasses my expectations, and to me is fast becoming amusing.

Messrs. Brothers, Batho, Croughton, and Samuel Fry (of Surbiton) seem well disposed to be prudent, knowing that works and facts would be more compromising than equivoques and insinuations; they decline accepting any offer of mine to test fairly the relative value or similarity of my patented process with that of Mr. Croughton. Knowing practically the worth of the two methods I can well sympathise with their caution, which is surely their best policy. Notwithstanding all their evasions I fail to see any reason for their refusing the challenge of the test offered if their method be as good as mine; for if these gentlemen have nothing to learn from me they can with equally good processes do equally good work, whilst if they have yet something to learn they ought to be happy to have the opportunity of so doing. For my own part I have always been pleased to learn from others and to pay for instruction in anything which might help me to elevate the standard of my professional work. It is easy for them to say that my challenge is too ridiculous for them to accept; so did the fox protest that the grapes were too sour for him.

I cannot condescend to notice the cowardly insult of "Anti-Quack," knowing that the opinion of men like the Earl of Ostrorog, Jabez Hughes, Sarony, Spencer, Sawyer and Bird, Reutlinger, Lacan, Maddison, Wolstenholme, Bradnee, Gregson, Higginson, Farrin, and the editors of the two London weekly photographic periodicals on the artistic results of my processes more than compensate for his ignorant insinuations with respect to the latter. Perhaps "Anti-Quack" is smarting under the uncertainty of the "How to secure expression in the sitter by rubbing his face with a brick-bat" process, or of the method of making backgrounds with a blacking-brush, or any such other Quackotype processes, as *chat échaudé craint l'eau froide.* If so, he has a right to get out of humour, but *not* to "stab in the dark." Let us have his name, so that we may at least know if he has ever produced works which qualify him for judging in such matters, then we should be able to discriminate as to the merit of his declamation against the necessity of photographic improvements. It is not gentlemanly to attack or insult under the cover of a *nom de plume,* especially when that is in itself a direct personal insult. Some time ago Mr. "Anti-Quack"—the "old editor"—might have got renown by spitting thunder and lightning at those "quacks," Daguerre and Niepce, for ungratefully accepting from their own country a considerable sum of money in compensation for their not patenting their hard-earned process of "doctoring," by actinic light, portraits previously obtained by the artist's brush. He would compare Daguerre's plates to Morrison's pills, a dose of which might calm his own nervous system.

In last week's number Mr. Brothers opens the fire, taking good care not to refute or even notice the only statement I had made in my letter in relation to him. Is he really serious when he states that "M. Lambert has no right to assume that Mr. Croughton only intended to use one side of the tracing-paper to retouch on with pencil?" Mr. Brothers has no more the right to assume what Mr. Croughton *intended* to do than I have; he must simply state what Mr. Croughton did describe. And this is what I have done; for it is not with patents, as in certain religious beliefs, the *intention* but the *act* which must be considered. According to the very handy axiom of Mr. Brothers, the individual who said in Queen Elizabeth's time "I'll put a girdle round about the earth in forty minutes" might be assumed to have intended to do so by a telegraphic wire, and thus strike Wheatstone and Morse from off the inventors' roll. Amidst other misstatements, Mr. Brothers says that in my letter I specially claim the use of stumps. This is incorrect, for I there simply claim the use of the combination of a sheet of semi-tranlucent paper on both sides of the negative or positive, and the retouching quickly on these two surfaces, as stated in my specification, which explains that the retouching is done with stumps, whilst Mr. Croughton uses pencils and Canada balsam on paper on the reverse side of the negative, printing through tracing-paper, which method, however nice in theory, is simply impracticable. I wish Mr. Brothers would be good enough to tell me in what part of my letter he has seen anything which entitles him to say:—"As M. Lambert only claims the use of these mi-transparent paper on the film side, surely the above quotation [Mr. Croughton's] settles the whole matter." This is a perversion of a written fact, and I defy Mr. Brothers to prove that I have written or said that I only claim the use of the paper on the film side. Mr. Brothers and everyone having read either my last letter or my claim must know that I do not claim the use of paper on the back only, or the front only, of the negative; neither do I claim the use of two papers on the negative with retouching on back only, or on front only, of negatives; but what I claim, and what I am prepared to defend against all infringers regardless of cost, is the use of the two papers combined with the retouching on both sides of the negative thus covered. Mr. Brothers tries to prove that the pencil and the stump are one and the same thing, for, says he, "a pencil may be hard or soft, and a stump is only a modified pencil." So he might say that a steam-engine is a modified boiling, covered kettle, although the assertion does not prove that all steam engines are

kettles. According to this kind of logic man is only a modified monkey, for both are bipeds. Then Mr. Brothers finishes by stating that he has worked my process for years. Now, if the reader look at this gentleman's letter in the issue of July 23, he will see that his process consists "in straining thin paper over a negative for the purpose of retouching," and, of course, he can continue to do so. I will answer that if this method, which has not much merit, satisfy him he is welcome to use it, as I have nothing to do with the sheet of paper over the negative for the purpose of retouching. By the way, has Mr. Brothers never bought the exclusive agency of a certain secret enlargement process for the town of Manchester? And, if so, for what purpose?

Now let us pass to Mr. Batho, who, after taking advice of his patent agent, undoubtedly, as I advised him to do, admits that his knowledge of patent law may not be so extensive as M. Lambert's, but denies having committed any blunders in his various assertions, saying that I took for granted that any and every legal point mentioned had direct application to the patent No. 1,634. It is not so. Mr. Batho made three different assertions applying to patents in general, as your readers will see by referring to his first article in your issue of July 23. First: he said that "if a patent be taken in joint names," &c.; now not one of my patents is taken in "joint names." Second: "The invention must be new, and never used before in a business manner *even by the inventor*." Although this last assertion has no relation to my case, I proved to Mr. Batho that his statement in this case was quite erroneous. Third: he says—"If a specification claim as part of the invention something new along with something not new it will invalidate the patent." I have proved to Mr. Batho that it is not so; that you can not only describe but claim a thousand old things to be combined so as to give new results. I even gave a case in which was claimed the use of hot blast and anthracite coal for smelting. The hot blast had been before used with common coal, and cold blast with anthracite coal for the same purposes, so there was a claim of two old things combined to produce a new result. Now Mr. Batho has been unfortunate, for out of his three assertions on patent laws one has no relation whatever to either of my three patents, and the two others are completely erroneous. Incapable of maintaining his first assertion he goes on to say:—"M. Lambert claims the method of applying the semi-translucid sheet on each side of a negative and of quickly retouching by operating on these surfaces," Mr. Batho purposely forgetting the following three essential words—"*as herein specified.*" Then he goes on to say that this may mean "method" or "application;" however, he continues, as the specification does not describe the "method" it must mean the "application." Now, had Mr. Batho not thought convenient to erase the three important words, "*as herein specified,*" he would easily have perceived that both the method and application are fully described in my specification. Then follows another incorrect assertion. Mr. Batho says:—"As this has been applied before, M. Lambert drops the claim to a semi-translucid sheet and falls back on the retouching of the two said surfaces." Will this gentleman please to tell me when I dropped the claim to the sheets of paper? I have written but one letter on the Lambertype patent, and I challenge him to prove I have ever claimed anything which I do not still claim. I always claimed the combination of one sheet on both sides of a negative and the retouching on these surfaces. I cannot drop the surfaces without dropping the retouching thereon, however pleasant this might be to Mr. Batho. Neither can I in a claim describe a working on a special surface without describing and claiming the new combination of both the surfaces and work to produce new results. The words "and the retouching on these said surfaces" do not sound much like my dropping these two surfaces to retouch on the two bare sides of a negative. I quote from my specification:—"What I claim as my invention is the method of applying a semi-translucid sheet on each side of the negative, and of quickly retouching on these surfaces." I am glad to see that Mr. Batho at last admits that "if Mr. Croughton had used paper on both sides, but retouched only on the front or only on the reverse side of a negative, such would not invalidate M. Lambert's patent." Now I stand prepared to prove that Mr. Croughton only commercially used one of the two methods just described, and only published one of them, I can also prove that he taught his pupils only one of them, and that before the South London Photographic Society he used only one of the above-named methods; and I challenge Mr. Batho to prove that my process as described in my patent has been either published or commercially used anterior to my patent. As Mr. Batho's only objections to accept my challenge is that I bind him to produce all the different results, chromotypes, &c.—well, I can afford to be lenient, so I shall only bind him to obtain all the results covered by the Lambertype patents outside of my two other patents; and I will give him double the time to produce as good effects, provided he uses none but processes commercially used or published before my patent. But I reserve the right to prosecute him should he infringe that patent. I am sure this will put a stop to Mr. Batho's scruples, unless he find it handier, as I think he does, to fight at a distance with useless words instead of facts and proofs. The usual way of testing the range-capacity of competing guns is to see how far the ball will reach with a certain charge of powder, and not for the competitors to lay their guns down and engage in a long controversy as to how far their respective guns have been said to, or might, or ought, to reach, or, as Mr. Batho says, to lay the guns down and have a fight to prove which is the best.

Mr. Samuel Fry (of Surbiton) having, in your issue of July 23, thought it proper to try to injure my process by asserting that he had "seen the operation of the Lambertype occupying several hours," I asserted that Mr. Fry had made an erroneous statement; that, knowing in what capacity he came, he only saw the work obtained by, and not the operating of, the Lambertype, which took several hours, and I can prove my assertions by photographers who were present. I am glad to see that Mr. Fry has now thought it prudent to alter his statement by saying it was the work and negatives of M. Lambert he saw, which is almost as different from his original statement as Mr. Croughton's process is from mine. Mr. Fry says—"I already had all I wanted, and all he had to sell." How is it, then, that Mr. Fry remarked to those present that he had got the Vanderweyde process for half-price, and that he did not intend giving more than £5 for my process? But, as "good wine needs no bush," I did not take the hint from Mr. Fry, not thinking his favourable opinion worth the balance of £15. Mr. Fry, then shaking hands with me, said, in the presence of my interpreter and Mr. Colton, photographer, of London:—"I am pleased to have seen your negatives; I am always ready to repair any mistakes I may have made, and I am glad to say the process is quite different from what I thought it was." And he further said that he would state so publicly —that he hoped to see me at his house the same evening, and congratulated me on my ingenious processes. As I did not avail myself of his invitation to visit his house in Surbiton I received a reminder in the shape of a letter given to me by Mr. Colton, and of which I here give a verbatim copy. Now notice that, although Mr. Colton's address was Walworth-road, London, this letter was addressed to my house; for what purpose I leave my readers to divine. Notice, also, the date of this letter:—

"*July* 19*th*, 1875.

"DEAR SIR,—It is now quite clear that M. Lambert's patent has been invented long before. In the *Photographic News* of December 24th, 1873, the method of putting paper on each side of the negative is described in full by Mr. Croughton. I adopted it at once, and have used it since; also Mr. Slingsby, of Lincoln, and many others, did the same. I fear as this fact is now generally known, your licensees will be asking for their money back.—Yours, very truly, "SAMUEL FRY.

"Mr. Colton."

The words "your licensees" sounds very much as if it was me, and not Mr. Colton, Mr. Fry wished to frighten. This letter was addressed to 19, Ashburnham-grove, where Mr. Colton never resided. Mr. Colton, to whom it was forwarded, sent it back to me, saying it concerned me and not him. By-the-bye, Mr. Colton also added a letter, too long to publish here, in which he says:—"I have seen every one of Mr. Samuel Fry's negatives anterior to your patent, and must say that not one of them has paper on both sides, with retouching on both sides." As I did not take any more notice of Mr. Fry's letter than I had of his generous offer of £5 and his cordial invitation to his studio, it *became generally known*, through Mr. Fry, *on July* 23—that is, five days after his letter to Mr. Colton—that Mr. Croughton had previously used a sheet of paper on each side of the negative. This is the simple truth, and Mr. Fry will prefer evading rather than refuting my assertions. The profession is now left to judge of the cause of Mr. Fry's opposition. This gentleman says, in last week's publication, that he prefers silver printing to chromotype. He has a right to do so, for there is work that gains by being perishable. But what Mr. Samuel Fry has no right to do is to say that Mr. Croughton invented the method in question, knowing, as Mr. Fry does, that Mr. Croughton has never described any other method than that of printing through paper (and not retouching on), with a sheet of tracing-paper strained on the reverse side of the negative to retouch on.

Mr. Croughton must really love to play the martyr if he can see any direct attacks on him in my last letter; but he makes a grand mistake when he thinks I will be sorry to have defended myself against erroneous insinuations, and in so doing have forced him to answer. Out of six licensees here today three were present when Mr. Croughton explained his process before the Society. One was his pupil; but the two others said that it was owing to the attacks on my patent that they had come to see the processes, knowing that if they were not good they would not be thought worthy of so much and so persistent attacks from non-licensees, and be so much praised by the licensees. I am told that Mr. Croughton has a weakness for claiming priority of inventions, but that his claims, though numerous, are not lasting. I am assured today that he claimed to have worked the Vanderweyde process very long before Mr. Vanderweyde himself—that he even wrote a few articles against what he called "that ridiculous patent," but that, after a while, either through contrition or for some other "trifling consideration," he suddenly and spontaneously became not only the great admirer of the Vanderweyde process, but condescended to join the process-vendors' profession (so dear to Mr. Brothers' heart) to repair the harm he might have done to the process; thus, like the great Clovis, "adoring what he had burned, and burning what he had adored." I think any man who is willing to canvass the country to sell to photographers another man's process might well be expected not to think it beneath his dignity to speculate with his own had it any commercial value.

Let all those who are not willing to pay for the use of my patents use the method described by Mr. Werge, or use ground glass varnish on both sides of the negative to retouch on. Of course, as Mr. Werge says in his letter, "no other method will produce as good results as the that of M. Lambert;" but this is no reason why these gentlemen should not use them to save the sum of twenty pounds.

A few more short answers, and I have done. Mr. Batho asks me "what is a conspiracy fund?" It is a fund raised by many men to fight one man; for instance, the fund hinted at by Mr. Slingsby would be a conspiracy fund, and, as such, illegal. Mr. Batho, also, in stating why he does not go to law about this matter, says:—"Victory in such a case in our courts oftener than otherwise is as costly to the victor as it is to the vanquished, which is the cause of many acts of injustice being submitted to." If Mr. Batho dares not, why advise others to do so? As Mr. Croughton seems to grudge my giving the £50 to the Society, I will give it to him if he gain the result of the challenge. With regard to Messrs. Brothers and Batho, as on our journey through England I shall visit Manchester and Halifax very soon, they will have the chance of accepting the test in their respective towns, or they will at least allow me to compare the results of their methods with mine.

Allow me, Messrs. Editors, to thank these gentlemen for the great help they have given me, as proved by all my new licensees. My knowledge of their powerlessness will be seen by my raising the prices of licenses on the 15th of this month, and of doubling them on the 15th of November; and I am almost certain to count these gentlemen amongst my licensees when the public will begin to understand that, notwithstanding the opinion of Mr. Samuel Fry, durability in good portraits is a quality to be desired.—I am, yours, &c.,

*Greenwich, August* 9, 1875. LAMBERT.

[M. Lambert's patent having been attacked by so many correspon dents, he considers that he is entitled to more than the usual amount of space devoted to controversial matters in order to make a final reply to all; and as he, the party first attacked, has now replied, we here terminate the controversy.—EDS.]

## EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at the small cost of one shilling in our advertising pages. This column is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

A 12 × 10 rolling machine is offered in exchange for a good opera glass.—Address, LOT DIXON, Colne, Lancashire.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

REV. J. S.—Not at present. Thanks.

JOSEPH JAMES AYLING.—Thanks for kind attention.

H. W.—Consult a local architect able to make a personal examination of the premises.

GROPE IN THE DARK.—We do not know who is agent for Derogy's lenses in this country.

F. O'B.—The collodion is old and worthless. You should not make use of it for any purpose, not even for cleaning dirty plates, as it would affect the eyes most injuriously.

J. GUNSTON.—Add more alcohol, and the probability is that the pyroxyline will dissolve. In future add the alcohol first, and, after shaking up, then add the ether.

J. S. B.—A pocket spectroscope suitable for your purpose may be purchased at an amount varying from a guinea to thirty shillings; but a really serviceable instrument will cost a few pounds.

W. T. T.—The plano-convex side of the condenser must be placed next to the sun. If the flat side be turned outwards the enlargement will be very unevenly illuminated. This is owing to spherical aberration.

C. B.—We reply at present only to your second query, not yet having had an opportunity of inspecting your plates microscopically. Either the Fothergill, the "hot water," or the gum-gallic processes will answer your purpose.

YOUNG AMERICAN.—So far as we can ascertain the suspension of the American National Photographic Convention is only intended to apply to the present year. We hope and expect that next year these interesting meetings will be resumed.

QUERIST.—Do not pay any attention to such quackery. It has been demonstrated over and over again that a circular aperture is the proper shape for the diaphragm, and that a vertical slit for a tall spire and a keyhole shape for a landscape is a piece of absurdity.

B. CLARKE.—To prepare crystals of salicine for the microscope place a small portion of this substance on the glass slide, and apply heat from a spirit lamp until fusion takes place. Next spread the fused salicine over the surface of the glass and fine crystals will immediately be formed.

J. BROWN.—The stains may be removed from the surface of the lens by smart friction with a clean finger charged with moist putty-powder.

OLD PHOTOGRAPHER.—You are probably not aware that the "Peripatetic Photographer" has forestalled you by a week in publishing the method of applying transparent paper to the back of the negative. See our last number.

LANDSCAPIST.—To count seconds tie a piece of thread to the bottom of the camera, and exactly forty inches from the upper end tie a very small plummet. This will vibrate once in each second. To make the oscillations keep time to the half-second reduce the length of the string to ten inches.

D. WINSTANLEY.—Our correspondent has sent a reply to Mr. Brothers' letter in our last. He refers to Mr. Brothers being advertised in 1872 as an agent for the sale of Sarony's enlarging process. Other matters of a personal nature are introduced into the communication in which our readers would not feel interested.

J. Y.—We have had too little experience in preparing gelatino-bromide to warrant us in giving you the "*best* formula for making an emulsion for rapid exposure." We are also uncertain as to the precise influence of temperature in preparing the same. Probably some correspondent will supply more information on these points than has yet been published.

T. A. C.—It is scarcely possible to tell within a grain or two how much pyroxyline ought to be dissolved in the ether so as to yield a good transferring film, because some samples of pyroxyline make a much more viscid collodion than others. Try eight grains; and if the collodion prove to be either too thick or too thin the remedy will in either case be obvious.

NHOJ.—Your proposal is very ingenious; but as respects simplicity it falls far short of the best of all preventives to the breaking of the bottom of a glass bath by the falling of a plate, namely, placing a small quantity of coarsely-crushed glass at the bottom. We never look with favour upon a complex method of effecting any purpose when the same can be secured by simpler means.

SYDENHAM.—Salt the paper with six parts of an iodide, three of bromide, and one of chloride. The iodide and bromide may be those of potassium, the chloride that of sodium. Let the paper be excited on a strong bath of aceto-nitrate of silver, and expose it while still wet. The development may be effected by means of a two-grain solution of pyrogallic acid, to which has been added a few drops of aceto-nitrate of silver.

KIT-KAT.—The addition of sulphuric acid to the developer will give to the positive collodion picture the metallic appearance you so strangely appear to admire. Make a twelve- or fifteen-grain iron developer; divide it into two parts, and to one of them add five or six drops of sulphuric acid, rather more than twice that quantity of acetic acid being added to the remainder. Next try and compare the effects produced by these two developers, and the great difference will become at once apparent.

BEGINNER.—Having burnt to ashes all the cuttings of old prints, filters, and other waste, weigh out sixty grains of the ashes after being well mixed, and further mix with this a little carbonate of soda and nitrate of potash. Subject the whole to the action of the blowpipe flame and then add a little borax. Next weigh very carefully the metallic silver obtained from the ashes thus operated upon; and having ascertained the weight of the remaining quantity of ashes an accurate estimate of the weight of silver that may be obtained from it can be made.

"ONE OF THE EXCURSIONISTS."—An Edinburgh correspondent, who encloses his card, writes under this signature, *re* Mr. Steele's letter, which is very fully dissected; but, as it has already been replied to in our last issue by Mr. Neilson, we think, after giving the following extract from the present letter, the subject had better be allowed to rest. Our correspondent deals with one of the three charges brought against his fellow-excursionists as follows:—"They knew not real enjoyment. They danced, they sang songs, they indulged in pleasant chat and merry laughter. What would our critic have made them do in his ideal picnic? He would have made them wander along a dusty road to look at hyacinths and forget-me-nots; and when, after a time, they naturally got tired of this, he would have made them sit down on the ground to look at the grass, or, as he poetically puts it—'rest their weary eyes on nature's greenery, and enjoy on a heathery knoll' 'the soft recumbency of outstretched limbs.' When one reads this, he thinks, involuntarily, of Peter Bell's companion by 'the river's brim'—a patient, but not over-intelligent, long-eared quadruped."

RECEIVED.—Rev. F. Hardwich; H.; M. Despaquis.

## METEOROLOGICAL REPORT,

*For the Week ending August* 11, 1875.

Observations taken at 406, Strand, by J. H. STEWARD, Optician.

THESE OBSERVATIONS ARE TAKEN AT 8.30 A.M.

| August. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 5 | 30·06 | W | 53 | 57 | 76 | 50 | Foggy |
| 6 | 29·90 | NE | 60 | 62 | 78 | 56 | Dull |
| 7 | 29·99 | NE | 61 | 64 | 76 | 61 | Dull |
| 9 | 29·77 | SW | 64 | 68 | 75 | 63 | Cloudy |
| 10 | 29·89 | S | 60 | 63 | 78 | 60 | Dull |
| 11 | 29·85 | W | 62 | 65 | 70 | 62 | Dull |

CONTENTS.

# THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 798. Vol. XXII.—AUGUST 20, 1875.


## THE ENLARGEMENT OF NEGATIVES.

In continuation of our article on the first part of this subject in last week's number it will be well to point out those methods of enlarging which are most suited to the requirements as well as to the capabilities of the ordinary amateur.

It is this branch of the process which has hitherto hindered the more general adoption of the system of small negatives, for we know that the majority of amateurs stand in the greatest awe of the very name of enlarging. Such is, no doubt, the result of the bulky, complicated, and expensive character of the apparatus manufactured for the use of the professional enlarger. It is our object in this article to point out the fallacy of such prejudice, and to show that the average amateur may, without any special apparatus not generally found in such studios, produce his own enlargements, within certain limits, with the same facility as his ordinary negatives.

There are two great principles in lighting made use of in enlarging, viz., solar and artificial light; but at present we shall confine ourselves to the latter, and of this, to the more convenient and cheaper, though, unfortunately, less powerful, lights in use for general illuminating purposes, viz., ordinary gas and the various mineral and other oils. The former is certainly far the most convenient to manage, but, unfortunately, even with an Argand burner, it is very difficult to obtain an even illumination, which is of the greatest importance. Of the various oils used for lighting purposes we think it is universally agreed at the present time that paraffine is not only the cheapest, but gives the best and most easily-managed light. Some recommend still a mixture of sperm or colza oil with camphor as giving a whiter light than paraffine; but we think it is very doubtful if such be the case, and even at the best the extra cost very far overbalances any advantage such a mixture may possess.

As to the best form of lamp it is rather a difficult matter to decide; but of the numerous different patterns in the market, both for mineral and colza oils, little difficulty should be experienced in selecting a suitable one.

Those who happen to possess a lantern (as do most photographers of the present day) are relieved of nearly all further trouble in the matter of enlarging. We say "nearly" because it will be found necessary to make some arrangement for placing the object lens and the negative to be projected upon the screen further apart than is found possible in the ordinary lantern. The necessity of this will be sufficiently obvious when it is considered that the lantern is constructed to enlarge a picture from about three and a-quarter inches to eight, ten, or more feet in diameter when used for its proper purpose, while for the purpose under consideration it is only requisite to amplify to the extent of three or four diameters. This is a mere question of increasing the distance between the lens and the negative and, at the same time, decreasing it between the lens and the enlargement.

If the lens belonging to the lantern be not achromatic, or is for any other reason unsuitable to the purpose, it may be replaced by an ordinary portrait lens of from six to eight inches focus. With such an arrangement it is only necessary to fix the lantern at such a distance from the screen that the requisite degree of enlargement is obtained, and, having focussed upon the screen itself, to fix the sensitive plate in the proper position by any suitable means, and then proceed to expose. A convenient arrangement is to procure a sort of easel (which must, however, stand perfectly perpendicular), provided with a movable stage or shelf upon which the plate is rested and may be adjusted in any position in a moment; a small spring at each side will ensure the plate retaining its position.

In the event of no lantern being available a very simple arrangement will suffice. As, however, the different parts will in this case be disconnected the first care must be to secure the centricity and parallelism of the whole arrangement. This may be done by procuring a board of suitable length and breadth, the edges of which are made truly parallel. A strip of wood is then attached to each edge in such a manner as to project about half or three-quarters of an inch above the surface, forming a sort of trough or guide in which the movable parts are made to slide accurately. The first of these consists of a wooden box to contain the lamp, in the front of which is made an aperture to hold the condenser. The interior of the lantern, if we may so call it, must be furnished with a reflector according to the means or taste of the owner. Two upright frames—the one to carry the negative, the other the lens—must be provided, in section resembling an inverted T (thus ⊥), the bases of which, like the lantern, must slide easily but accurately in the guide. It will thus be seen that, if the various parts be properly constructed at the outset, the centres of the source of illumination, the negative and the lens, will be continually in a straight line without any trouble in adjusting. This arrangement is placed upon a table or suitable support in front of the easel previously described, and is used in the same manner as the lantern. The whole may be constructed in a few hours by any ordinarily intelligent amateur mechanic.

And now as regards the chemical portion of the work. It is almost unnecessary to reiterate what we said last week in speaking of the process to be followed in taking the small negatives. We then stated that it is optional whether the reversal of the image be performed in the first or the second stage of the operation; that is, whether the small negative be transformed into a positive, or whether an enlarged positive be produced and changed into a negative. We also expressed an opinion in favour of the latter alternative, for reasons which we then gave. If, however, the former plan be adopted it matters not what process be employed in making the enlargement, as the wet process will answer equally as well as any other, and silver development may be resorted to if such be desired. If, on the contrary, the enlargement be made from the negative, it is imperative that some form of bromide plate, with alkaline development, be used, as the image so obtained is the only one which can be satisfactorily reversed by the acid treatment.

Provided that these conditions be adhered to it is of no consequence whether the plates be used wet or dry; but for the sake o shortening the exposure we prefer to use them wet, or, at anyrate, "moist." In our number for July 30, at page 361, we gave the necessary formulæ and directions for so working bromide plates, and we think the process there described, with alkaline development, will be found the best for the purpose under discussion. With such

plates an enlargement to four diameters from one of the specially-prepared negatives or positives should be obtained with an exposure of from three to six minutes with one of the double-wick *sciopticon* lamps.

Extreme care will be found necessary in handling the enlargement after its treatment with acid, as the film becomes very tender and liable to leave the glass. An albumen substratum appears to be of little use in making it adhere, and for this purpose we much prefer a solution of india-rubber or gutta-percha, the acid apparently having less effect upon these substances than upon the albumen film. A little practice will, however, remove all difficulty in that direction.

It is needless to say that enlarged prints upon bromide of silver paper may be obtained in the same way as upon glass; but we believe that our readers, especially amateurs, for whom we have penned these remarks, will agree with us that *le jeu ne vaut pas la chandelle.* When, with less trouble, a negative may be produced, always ready for direct printing and giving results surpassing those by development upon paper, we think it scarcely necessary to say more on the subject of enlargements direct upon paper.

## ON THE COMPARATIVE MERITS OF NEGATIVES FROM WET AND DRY PLATES.

The question of the relative value of negatives from wet and dry plates is one that has been frequently discussed, and one that it is somewhat difficult to settle—certainly for any considerable period of time—as any material progress in either the one or other of the rival processes must inevitably turn the balance in its favour for the time being.

We observe that Dr. Vogel has been writing on this subject in a foreign contemporary. Now, whatever may be the relative merits of English and continental photographers so far as the working of wet collodion is concerned, there can be no doubt in the mind of any attentive reader of photographic literature that we are considerably ahead of our continental friends in the matter of dry plates, as no one can have failed to observe that old and well-known processes are again and again brought forward at their meetings, and things introduced and highly lauded, which have long since been by us discarded or superseded by something much better.

Although aware of the state of matters in connection with dry plates amongst photographers on the continent generally, we were hardly prepared to hear Dr. Vogel say that if the same landscapes are taken at the same time on wet and dry plates, the superiority of the wet plates as regards beauty and harmony is undoubted, or that dry plates, even when over-exposed, give too strong contrasts, while the wet plates give the light and shadows much more clearly and with far more detail. That this is true of all or any of the dry processes in the hands of those who are not thoroughly acquainted with them we have no doubt; but we are equally certain that it is just the opposite of truth when applied to a dry plate manipulated by one who thoroughly understands how to manage it. We know that this is the opinion of many of our most successful landscapists, and we think it is founded on pretty reliable evidence, both from the examination of actual results and the consideration of the nature of the sensitive surfaces, as well as from the nature of the deposits of which the images are formed. For scientific or technical purposes, where exact measurement is required, it must be a decided advantage to know that the image was impressed on the film while it was in the same condition as when the work was completed, and so not liable to be affected by contraction. This, of course, cannot be in the case of the wet collodion film, the contraction of which, on drying, is in some samples of collodion so great as to render of little value any measurements that may require to be made.

Then the deposit of which the image is formed is in the case of wet collodion very different from that of the dry process, or, at least, some of the dry processes. We have so repeatedly directed attention to the fineness of the silver forming the image in an emulsion plate compared with a wet collodion plate with iron development that we need not here further allude to it. We refer to the atoms of silver when subjected to microscopic examination.

Of course we do not wish to say that the average dry-plate work of the present time is better than the general run of wet collodion landscapes in the market. This could not be expected, because, for some reason or other, professional landscapists still prefer wet collodion, while the dry plates are generally in the hands of the amateur with little leisure to work out any particular method of manipulation. But what we assert, and on what we think unmistakable evidence, is that wherever the same perseverance and ability are brought to bear on the two processes the result will be largely in favour of dry-plate work.

The great desideratum in the working of dry plates is a thorough acquaintance with the best method of development, and a knowledge of how to take advantage of the facilities in this direction which a dry plate offers. In a landscape with a foreground of dark foliage, and the distance made up of sky and, say, well-lighted hills, wet collodion would really fail, because the distance would be altogether obliterated before the foliage could be sufficiently developed—at least such would be the result if development were carried on in the ordinary way. In the case of a dry plate, however, the matter is perfectly simple. The development may be carried on till the distance is satisfactory, the plate washed and dried, and the distance protected by a coat of varnish, and then the foreground brought up without trouble.

As a curious illustration of the true position of dry-plate work on the continent we may say that Dr. Vogel, in the article to which we have already referred, gives as one of the *last steps* in dry-plate work the fact that we may now purchase the prepared films, so that we are spared the tedious and time-absorbing operation of producing the plates ourselves, forgetting, apparently, that such plates have been articles of commerce here for, we suppose, at least something like twenty years. He says, also, that he does not like the preparation of dry plates, and for that reason prefers to purchase them. Now, we know that there are most excellent plates in the market, and that much really good work is done on such commercial articles; but we have a strong impression that those who aim at the very highest class of work should make a point of preparing their own plates—not that they can make them better, or even so good, as those which can be purchased, but because they will by practice make plates which will better suit their purposes. A rider likes to know his horse, and a driver his engine, and so must it be with a dry-plate worker. He should not only know how his plates are prepared, but be so thoroughly acquainted with every little detail of the manipulation as to be able, by the multitudinous modifications too trifling to be here detailed, to so vary the sensitive film as to have it in the best state for all the varied conditions under which he may wish to work.

## THE VANDERWEYDE SYSTEM OF LIGHTING STUDIOS.

We now redeem the promise recently made of giving an account of the method of lighting studios for which Mr. Vanderweyde has obtained a patent.

Two main principles underlie this method. The first is this—that no light should be admitted into the studio except that which serves to illuminate the sitter. It requires no laboured dissertation to prove that all stray light in a studio is bad, or that when such stray light enters the lens in such a volume as to produce flare and flatness it is positively mischievous. The second principle is that more light is transmitted through glass when it is placed at a right angle to the direction of the light than when it is placed at any other angle; in other words, more light is transmitted through a pane when it is interposed directly between the sitter and the light than when it is placed in an oblique or slanting direction.

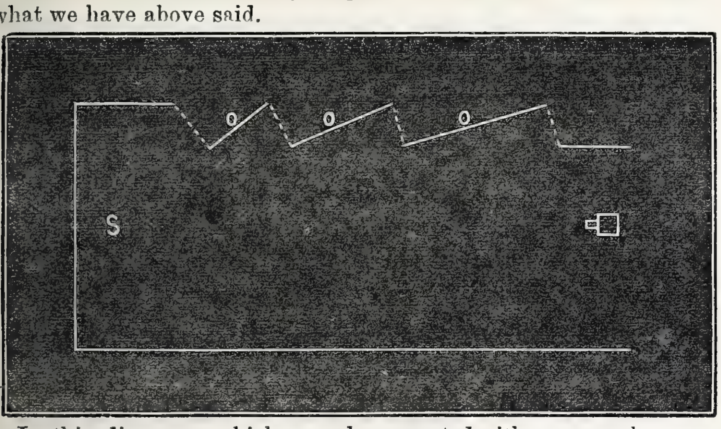
It will be in the recollection of many of our readers that, a few years ago, the subject of adjusting the direction of the light by means of louvre-boards received much attention, and was made the theme of a considerable amount of correspondence in this Journal. By the judicious use of louvre-boards a great power is placed in the hands of a skilful photographer, for by their agency the light may be concentrated upon any portion of the studio. We do not at

this moment recollect the precise way in which the louvre-boards patented by Mr. McLachlan, of Manchester, were fixed; but we have a vivid remembrance of those in the studio of Mr. Stuart, of Helensburgh, of which we gave a description in one of our papers entitled *Reminiscences of the Edinburgh Meeting of the British Association*, in 1871; for, being hinged at the edges, they were capable of being turned in any direction, so as to place each end of the studio in either a mass of light or of darkness at will.

In explaining the *principle* of Mr. Vanderweyde's method of lighting we shall for the moment ask the reader to keep before him the louvre-board idea, and to assume, further, that these boards form fixtures in the sides of the studio, being so placed in relation to the sitter that their edges only are seen by him or her. This, it will be obvious, fulfils in the most complete manner the condition of directing the light in the proper way; and it does so permanently, for, being fixed, no displacement can take place either by accident or design, and no light is permitted to fall upon the camera.

But by placing the panes of glass in such a manner that one side is fixed in the outer edge of one of these boards and in the inner edge of that next to it; that is, in the inner edge of the board farthest away from the sitter and the outer one of that immediately adjoining it—this arrangement being carried out throughout the entire series—the panes are placed in such a way as that each will be interposed *directly* between the sitter and the light, and each pane will be in such a position as to stand opposite to the sitter, thus transmitting the maximum amount of light.

We here introduce a fancy diagram of a studio, to render clearer what we have above said.

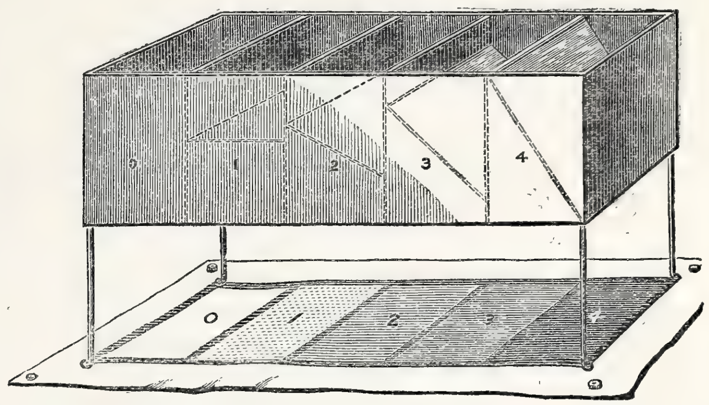



In this diagram—which may be accepted either as a plan or a section, according as top light or side light is meant—the sitter is placed at S, the camera being situated at the opposite end of the studio. The opaque lines O, O, O are opaque boards, as thin as convenient, all of them pointing direct to S, the sitter, who sees only their edges as so many dark strips. The dotted lines represent the glass panes, which, although only four in our diagram, admit quite as large an angle of light as if the roof or side of the studio were glazed from the sitter to the camera, with this further addition—that not only does the light pass *directly* through each, even the farthest, pane to the sitter, by which its quality is improved, but also not a single ray of light transmitted by the glass can fall upon the camera.

This brings us to a more complete consideration of the second principle referred to, namely, the transmission of light through the glass. It is an established fact that in proportion to the placing of the glass at a right angle to the sitter so will be the intensity of the light transmitted. Using a plate of plane glass as a mirror—familiarly seen in the reflections of a well-cleaned shop window—it is a principle that less light is reflected from an object placed nearly opposite to such a pane than to one situated in a very oblique position; and the measure of the perfection of the reflection is, in an inverse ratio, that of the transmission. This goes on up to a certain angle known as the "angle of total reflection," when none of the light is transmitted, the whole being reflected.

This principle is illustrated by the following ingenious contrivance represented in the diagram—

FIG. 1




In this is shown a black metal box, without top or bottom, fitted with four partitions. The partition marked 0 has nothing in it; No. 1 has a plate of glass placed at a right angle, as shown by the dotted lines; while the plates in spaces Nos. 2, 3, and 4 are placed at increasing angles. This box is represented as standing on four supports on a sheet of white paper, the light passing vertically from the top and throwing underneath the shadows as represented. It will be observed that there is very little difference between the shadow cast by the sheet 1 (that at a right angle) and the complete opening 0, and that the moment the glass assumes a slanting direction so does the light suffer obstruction through reflection and absorption, and increases in proportion to the obliquity of the angle at which the glass is placed.

After the foregoing remarks we now introduce a diagram (*fig.* 2) showing the construction of Mr. Vanderweyde's new studio window.

Here is shown the plan of a studio fitted with the patent window, between the walls A A. B and C are two points near each end of the studio at which the sitter may be placed. In constructing the window the vertical sashes D are first placed at equal distances, which depend upon the width of the glass to be used—say two

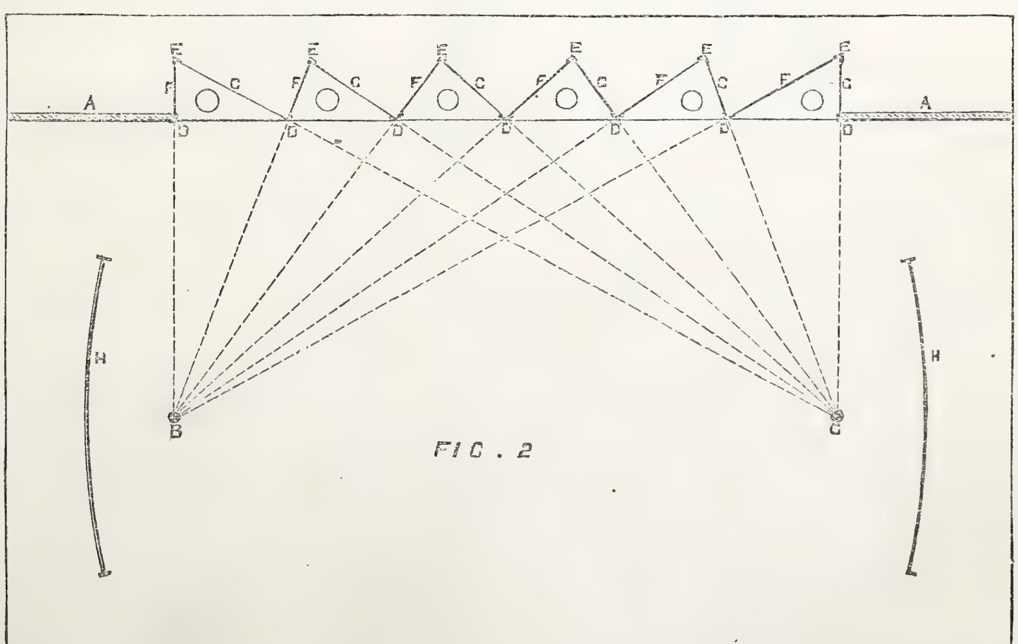



FIG. 2

feet apart. The glass is placed between the inner row of sash-bars D and an outer row of bars E, the position of the glass

being shown by the lines F and G. To find the position of these outer bars E we draw the radial lines from the points B and C respectively through the points occupied by the sashes D, and at the points where these lines first intersect the sash-bars E are placed. The panes of glass are thus divided into two sets facing in opposite directions. All the panes of the one set F face as nearly as possible the point B, at the same time that they are edgewise or radial to the point C; while, on the other hand, the panes of the other set G face at right angles to the point C, and are edgewise or radial to the point B. Thus arranged, the double row of sash-bars do not obstruct any more light than a single row, and it will be seen that if the sitter be placed at B the glass G can be darkened by blinds or shutters, the light only being admitted through the panes F; so that without obstructing any of the light passing in the direction of the sitter the light is cut off from the other end of the studio. If the sitter be placed at C a complete reversal of this arrangement takes place.

We have been present in the first studio in which Mr. Vanderweyde's plan was utilised at one end, and where comparative trials were made, on one plate, between the old and new systems of lighting. In both sittings the same angles and direction of light were employed. After what we have said concerning the absolute soundness of this principle of lighting it is almost needless to observe that the experiment was highly satisfactory.

It is hardly gratifying to find that while so much attention has, most deservedly, been paid to the chemistry, the optics, and the art-aspects of photography, the subject of the proper construction of studios has been left so long in abeyance. Undoubtedly the best light possible would be that obtained in a studio entirely devoid of glass; but, as this is clearly inexpedient except during some very few days in the course of the year, the next best is certainly that system by which the light is allowed to fall upon the sitter with the least amount of obstruction, which condition is admirably secured in the window above described. By this system the light can be rapidly changed from darkness to full blaze, or to strips of light running either laterally, diagonally, or vertically at will, or to a cross or a circle of light, so that all manner of edge lights or Rembrandt effects are possible, these effects being controlled by spring roller-blinds.

A point of great interest—namely, the introduction of the alkaline gold toning bath—is raised in the valuable contribution to the history of photography, to be found in another column, by the Rev. T. F. Hardwich—a gentleman who, from having for a considerable time taken a most important part in the progress of photography at an early period in its annals, is better able than any other person living to speak authoritatively on the subject of positive printing. That a revolution in silver printing was effected by the introduction of alkaline gold toning is one of those obvious facts in photographic history which do not demand any comments on our part. Prints were made more permanent than heretofore, and in consequence of this fact the public became gradually reassured, and confidence in the stability of photographic works of art, then fast waning, again revived. We here introduce a trite photographic platitude and say that the conditions under which prints fade are but imperfectly understood; and we do so for the purpose of observing that under certain conditions even prints that have been toned with bichloride of mercury sometimes retain a charming appearance for several years. It will, by some of our older readers, be remembered that about seven or eight years ago we gave a description of the method of printing by means of wet collodion and the camera practised in the establishment of M. Disderi—at that time of London; and we detailed the means we saw adopted by M. Prætorius, who was demonstrator on that occasion. A number of collodion prints were developed as thin transparencies on a large plate of glass, and after being fixed they were toned by bichloride of mercury, washed, and immediately transferred to glazed or faced paper. They were then handed to us as *souvenirs* of our visit. These prints are still fresh and good, notwithstanding the well-recognised fact that bichloride of mercury is one of the most suspicious toning agents for collodion images in the photographic pharmacopæia.

In our brief summary, in the column of *Foreign Notes and News* last week, of M. Pokorsky-Joravko's paper on *Nocturnal Photography* we were unable to give more than the barest outline of his method of working. The subject, however, is one which opens up quite a new branch of photography, and deserves a little attention, at least, from those among our amateur readers who find the time hang heavily on their hands during the evenings of the off-season of winter, or, indeed, at any time. Though artificial light has been in regular use for years in the production of enlargements and transparencies, and has also taken its part in various attempts at portraiture and the like, no very successful results have been recorded in the direction suggested by the able contributor to the *Moniteur*, even with such powerfully actinic lights as the oxyhydrogen and magnesium. But when we are told that by the aid of two kerosine lamps—and those of only four-candle power each—perfect copies may be obtained of engravings, maps, charts, and other objects of a similar character, a new power is placed in the hands of those whose want of time precludes, at least during the winter months, the possibility of devoting any attention to this most interesting branch of our art. No doubt our readers who may choose to experiment in this direction will find out for themselves many little useful applications of the method not mentioned in the paper from which we quote, and, as an assistance in attaining success, a few remarks as to the exposure said to be necessary may not be out of place. In the first place, the actinic power of M. Pokorsky-Joravko's lamps is said to be four candles (*bougies*) each, but whether the standard candle or *bougie* in France is equal to the usual English standard we are unable to say; this remains a matter for future experiment. The author of the paper in question gives a table of the exposures necessary with different lights, varying in power from one to two hundred and forty *bougies*, for the production of "direct positives." By this term we presume he means the production of glass transparencies from negatives by the aid of the reflected light from the surface illuminated by the lamp. According to that table the exposure necessary with a single candle-power light would be two hundred and forty seconds, and as the light increases in power the exposure decreases in direct numerical ratio, so that a light equal to ten candles would necessitate an exposure of only twenty-four seconds; eighty candle-power only three seconds; while the effect of two hundred and forty candles would be an *instantaneous* impression. This principle we cannot help saying we think to be incorrect. We do not feel disposed to assert that a direct *geometrical* progression would be absolutely correct, though we believe it would be much nearer so; but the descending ratio would, we think, be much smaller than shown in the table mentioned. No statistics as to the exposure required in the production of negatives of engravings, &c., are given, but we presume the difference would not be considerable.

## MISCELLANEOUS NOTES ON PHOTOGRAPHIC SUBJECTS.

### Keeping of the Negative Bath.

I do not know if the observation has been made before, but it seems not unlikely, that the permanent good order of the bath may be more or less influenced by the nature of the means employed for cleaning the plates. It will be recollected by the readers of this Journal that many years ago I recommended the use of potassium bichromate and sulphuric acid for this purpose. In looking lately over some notes I find that after I commenced using this detergent I found my negative baths much less apt to get out of order than previously, owing, apparently, to the greater cleanness of the glass, or, possibly, that in using other methods previously the detergent had been less easy to remove thoroughly from the glass surface.

Some persons use acid mercuric nitrate for this purpose—a substance which has great solvent power for silver haloids, and thus is much more effectual in cleaning glass plates that have been used and rejected than is nitric acid alone. But the introduction of the

smallest quantity of mercury into a negative bath would have a most fatal effect, because mercury destroys the sensitiveness of silver salts to light in a very remarkable manner. Others use solutions of caustic alkali, the introduction of a small portion of which, adhering to the glass, would naturally tend to injure the bath.

Of course where care is taken and the water supply is abundant a detergent may be very completely removed. But in the absence of either of these conditions nothing would be more easy than the introduction of small quantities of the substances used as detergents, and with scores or hundreds of plates the effect would be very marked.

PHOTOGRAPHY WITH CLEAN FINGERS.

Not long back an earnest appeal was made in these columns for a method of operating which could exempt the amateur from incurring the risk of silver stains. It seems to have been overlooked that an incidental advantage connected with Mr. W. B. Bolton's washed emulsion process is that it accomplishes this object. The same is also true of the chloriodo-bromide process, which I have published in your columns. As every trace of the excess of silver nitrate is washed out from the flakes after they have set, there is none in the final emulsion; it therefore cannot stain. Experience confirms this statement. I have frequently had drops of this emulsion fall upon my hands, and in no case did stains result. Everyone who has used emulsions of the ordinary sort, made with excess of silver nitrate, knows that the stains which it makes upon the hands are particularly difficult to get rid of.

The development, also, of the chloriodo-bromide plates can be conducted wholly without silver. With a good emulsion and a fair exposure any amount of density can be got by the alkaline development alone. It may, therefore, fairly be said that in this way photography may be practised with little or no detriment to the hands—a feature which, no doubt, will be generally acceptable. It is no exaggeration to say that many persons are deterred from taking up photography by unwillingness to submit to the staining which is often thought to be inseparably connected with the practice.

FUSED SILVER NITRATE.

I have on frequent occasions expressed a preference for the fused nitrate over the crystallised for emulsion work. This preference is not owing, as was said in some recent editorial remarks, to questions connected with the presence of water, but to the fact that the fused nitrate contains (as is well known) silver nitrite as well as nitrate. In order that a sufficient amount of this reduction shall take place I have recommended, in giving directions for the preparation of fused nitrate, that it should be kept in a state of fusion for ten minutes. Silver nitrate needs no desiccation, as its crystals are anhydrous.

Why the presence of silver nitrite should act temporarily is not very clear. When decomposed—by cadmium bromide, for example —the nitrous acid passes into combination with the cadmium oxide, and is subsequently washed out; it therefore might be concluded that it can exert no influence. But it is a familiar fact that the temporary presence of silver nitrate in excess, though subsequently completely washed out, leaves a permanent influence behind it.

M. CAREY LEA.

## GLYCOCOLL IN THE DEVELOPER.

IN answer to your request for the formula of my glycocoll, I beg to say that I prepare it as follows for wet-plate work:—

Weigh out 320 grains of gelatine and put it into ten fluid ounces of distilled water, with which two drachms of pure glycerine have been thoroughly mixed. Leave it to soak all night, and in the morning drain off the surplus water entirely, and add an ounce and a-half of pure sulphuric acid, adding a little more if required to ensure perfect solution. Stir it till the gelatine is all dissolved, and let stand till quite cold. When cold add to it ten fluid ounces of distilled water, and filter. When filtered neutralise *very carefully* with liquid ammonia, and add three drachms more of pure glycerine, which must be thoroughly incorporated by stirring or shaking in a stoppered bottle. This preparation will keep any time, and is very far superior to the one made by the addition of iron to the gelatine solution.

You will, perhaps, remember that many years ago I wrote strongly recommending the use of formic acid in the developer; and I am sure that a thirty-grain solution of iron, with sufficient of the above glycocoll solution and formic acid to restrain fog, is the best developer that can be used.

With this developer, and by taking advantage of the great increase of sensitiveness given to the silver bath by the addition of nitrate of uranium, I have done some wonderfully rapid work lately.

H. STUART WORTLEY.

## REMINISCENCES OF TWENTY YEARS AGO.

No. II.

THE title of a spirited article in one of the early numbers of the *Photographic Notes*, by the lamented editor of that journal, the late Mr. Thomas Sutton—*Gold* versus *Old Hypo*.—will indicate the subject in which an especial interest was then felt, viz., the permanence of photographic prints. It is not easy at the present time to realise how little was at first known of the chemistry of the process commonly employed. The prints were sometimes red and sometimes black in colour, and the only explanation was the *age* of the fixing liquid. "It must be kept," said one, "until it becomes old and mellow, and then it will bring out the dark tones." This was the remark of an amateur; but I have heard a chemist say that science would never solve all the minute and intricate changes to be met with in photography any more than it would be able to manufacture *old* wine at once from new.

Upon one occasion I called on Mr. Roger Fenton, whose name I mentioned in my last article, and found his assistant busily engaged in immersing a quantity of sensitised paper clippings in the fixing solution of hyposulphite of soda. He explained to me that the "old hypo." had been thrown away by mistake, and that he was making as near an approach to it as he could. I suggested the addition of chloride of gold, but he replied that with plain paper such as they were using the gold tones were too cold and blue; what they wanted was a ready mode of making new hypo. into "old." I thought it possible that I might find out a means of doing this, especially as I observed a milkiness from deposited sulphur. At first I tried the addition of an acid. This produced the effect, but at the expense of the half-tones, the action being rapid and uncertain. It then occurred to me to mix with the fixing liquid another of the series of compounds to which the hyposulphite belongs, but more unstable, viz., the *tetrathionate.* The result was very satisfactory, even more so than I anticipated, and all who witnessed the experiments agreed that the problem was solved. The colours were rich and good and the whites well preserved. At the time of making the above experiments no one had any idea that the tones produced by sulphur were so fugitive. It was only when large, handsome pictures were seen fading away in the shop windows that the truth began to be suspected; and by degrees the confidence of the public was thoroughly shaken. The London Photographic Society, believing the very existence of the art to be imperilled, determined to appoint a committee of investigation, and the late Prince Consort, on hearing of it, at once sent £50 towards the expenses. The experiments were made in the laboratory of King's College, under my superintendence, and the results were printed in the Society's journal. Nothing could be more satisfactory than the conclusions at which we arrived, and it was plainly shown that silver prints were sufficiently permanent if properly toned and fixed. The idea had been gaining ground that the colours died out on exposure to light, like certain water colours and Berlin wools. It was proved, however, that light had no effect, and that when any deterioration was observable it was due to causes which could be removed. The faded prints were found in every instance to be either *sulphur*-toned or imperfectly washed from the last traces of hyposulphite of soda. Sulphur, by its superior affinity, combines with the silver of the print, loosening and destroying the organic combination which previously existed, and the result is a pale yellow image of sulphide of silver.

After the Committee had made its report it was thought desirable to show specimens of the results at the Exhibition of the London Photographic Society; but this good intention was frustrated by an amusing incident which happened. The plan adopted had been to cut a *portrait* in half, by drawing a knife vertically down through the middle of the face, one half being preserved in a dry place and the other subjected to the action of moisture and other fading agencies. The two halves were then placed in juxtaposition, and a large frame filled in that way was suspended upon the wall. The first day's exhibition was private, and the Prince Consort, who was present, examined the frame and expressed himself satisfied with it. On the second day, however, which was a public exhibition, to our great surprise the *original* of the portrait appeared, with a lady leaning on his arm; and, on seeing his own face so maltreated, proceeded at once to make preparations for smashing the glass with a gold-headed cane which he held in his hand. He could only be pacified by a promise that the obnoxious

frame should be removed, and this promise was faithfully observed. I am not able to say how the mistake happened, or who was responsible for it; before printing from the negative I had been told assuredly that the original was miles away, and would neither know nor regard it.

The committee on the fading of photographic prints were unanimous in deciding that *gold* must for the future be the toning agent, and not sulphur; also, that the toning and fixing should be conducted separately, and not by a single operation. The mixture of chloride of gold with hyposulphite of soda produces tetrathionate and other compounds parting easily with their sulphur. Even the *sel d'or* is not theoretically safe in that respect; whereas if the print be first toned with chloride of gold, and then fixed in a separate bath, it cannot receive any injury.

I did not at first succeed very well with chloride of gold, in consequence of its biting action on the half-tones. Afterwards I met with a suggestion by a French writer, whose name at this distance of time I do not remember, that the solution should be used "alkaline" instead of acid. Finding the process effectual I tried it with different proportions of alkali, and inserted it in a new edition of my work on *Photographic Chemistry*, giving six grains of carbonate of soda for each ounce of water.

In one of the recent numbers of this Journal I think it was stated that Mr. F. Frith first employed alkaline chloride of gold, and that the process oozed out from his having casually mentioned it to me. This, however, must be a mistake. Mr. Frith was too shrewd a man to mention anything to me which he wished to keep secret; and, indeed, I am not aware that he had any secrets at all. It is quite possible that Mr. Frith may have been the first to use alkaline chloride of gold with *albumenised paper*, and that he may have shown me prints prepared in that way. If so, I should at once have made a note of it, because in my earlier experiments on plain paper the tones I obtained were blue and slaty.

Having had an opportunity of visiting some of my old friends in London this summer, I was sorry to hear them say that the cry of instability of photographic prints was once more being raised. My own confidence, however, is unshaken, inasmuch as I have still by me the prints of twenty years ago as bright and clear as ever. Proper pains must be taken in toning, washing, and mounting the pictures, after which there will be no fear of deterioration if they are kept in a dry place. T. Frederick Hardwich.

## ADAPTING A SOLAR CAMERA TO THE LIME LIGHT.

Many years ago, when I commenced enlarging by artificial light, I found myself in just the same fix as the correspondent you mention in your last issue. I knew little or nothing of optics, and at that time I found it impossible to obtain any information as to enlarging by artificial light, it being so little practised; consequently I had to buy my experience at a pretty high figure, and it was only after a number of experiments that I succeeded in doing what I wished.

In the first place, your correspondent must obtain another twelve-inch condenser similar to the one he has; also a small meniscus lens about three inches in diameter. I should recommend him to discard his solar camera as far as artificial light goes, as it will be found more convenient in this process to focus by moving the lens instead of the negative, as is the case with the solar camera. His best plan will be to obtain five pieces of wood about fifteen inches square and three-quarters of an inch thick (drawing boards will do); these should be mounted on base-boards about four inches in width so as to stand upright on a table. Two of these boards should have circular apertures cut in them twelve inches in diameter, bevelled off so as to receive the two twelve-inch condensers, which can then be secured in their places by wooden buttons; the meniscus should also be mounted in a similar manner. A portrait lens is to be fixed on to another of the boards, and a couple of grooves should be screwed on to the remaining board for the negative holder belonging to the solar camera to slide in, an aperture having first been cut in the board the size of the largest negative intended to be used.

The above apparatus must be arranged as follows:—The board with the meniscus comes first, the concave side next the light; then come the two twelve-inch condensers, convex sides facing each other; then the negative holder; and next the portrait lens. The me light is now to be placed behind the concave or outer side of the meniscus and the image thrown on to a screen. The parts should then be moved about and adjusted until a clear, sharp disc is obtained.

In making these preliminary trials the arrangement holding the negative should be removed; and I would also recommend a couple of parallel laths being nailed to the table in order to keep the various parts true and square when being moved backwards and forwards. It is of the greatest importance that the whole arrangement should be correctly centered; that is, an imaginary line drawn from the source of light should pass through the exact centre of the whole system of lenses, any falling off in this respect making itself apparent on the screen. The lime light should not be more than six inches from the meniscus; this, however, depends on the focus of the last-mentioned lens. The best way will be, if possible, to obtain several on trial and select the one which answers best.

The negative should be placed at such a distance from the condenser that the cone of rays proceeding therefrom should just cover the amount of subject intended to be enlarged.

The above is a description of the apparatus in its simplest and cheapest form. It can, of course, be altered and modified at will. It may be made of mahogany, sliding in a French-polished and brass-bound camera, with rack or endless screw movement, but the principle remains the same. B.

## ON PNEUMATIC HOLDERS, AND HOW TO REPAIR THEM.

I know many operators scorn every possible form of this handy little instrument, but in my own practice I find it invaluable, I would not be without it. "Let him laugh who wins;" after taking, developing, and intensifying thirty or forty negatives my hands, so far as chemical stains are concerned, are generally as immaculate (with the exception of two slight spots) as at the beginning of the day's work; and, to say nothing of the gain in cleanliness of the negatives from the absence of finger stains, who can deny the great advantage of being able to appear before a lady sitter with presentable digits, from which she will not shrink when one attempts to dispose in suitable folds any delicately-tinted drapery donned for the occasion—perchance a bridal dress of white, or, still more sacred object, the christening robe of an infant? I use the holder of one shape or another both for collodionising and developing; of course not the same for each purpose. I also use it to place the plate in its place in the slide; but for this purpose and for collodionising I do not object to use the same instrument.

I have tried almost every form made, from the earliest one, with a brass finger plate requiring both hands to work it properly, to the latest novelty out. The globe pneumatic holder is almost as useful as any from its excessive handiness; but it has one grave defect; it will not stand upright of itself when attached to a plate—a contingency certainly not of very frequent occurrence, but yet one which is at times of considerable importance. I think that modification of it where the globe is surrounded by a thin cylinder of wood just low enough to clear it when the holder rests on the operating table is to be preferred to any. The whole action of fastening or loosening can be performed with either hand, while the other is occupied, by adjusting the pressure on the ball with the thumb; and it is generally so well made that the slightest pressure is sufficient to securely attach a plate of moderate dimensions.

For developing I was formerly in the habit of using a holder made of thick galvanised iron wire, upon which the plate was held cornerwise by two gutta-percha supports which were pressed together by the elasticity of a piece of india-rubber tube attached at each end to one of the supports, the wire being passed through the tube and fastened permanently at its end to one of the supports. This was a very useful holder and answered well; but it required two hands to work it, and I have entirely discarded it for some years in favour of the pneumatic holder I now use with perfect satisfaction. This consists of a globe-holder made entirely of rubber, apparently all in one piece, though really in segments, and having no brass work or screws about it. It is, further, permanently attached to a long polished wood handle. A plate $12 \times 10$ inches can easily be manipulated with it, and for tent work, where one's hands are especially liable to stains, it is invaluable. The one I have in the studio has been in daily use for about twelve months, and is apparently as good as new. The first I had appeared to have been defective, for it gave way in the globe at one of the seams, and was thus rendered useless. They are rather expensive to buy, and, if liable to such defects as this, would be very costly things; but I should be inclined to believe that this splitting was entirely accidental—at any rate, my present holders do not show a sign of giving way.

As the plate is naturally always damp when the developing holder is attached any little hardness or inequality, short of a decided elevation, will not interfere with perfect adhesion, and no special

precautions are needed to keep the flat top of the holder in a proper state. But the very reverse of this occurs in the pneumatic holders for collodionising and silvering. They require to be kept scrupulously clean, and, in course of time, no matter what course is pursued nor how carefully they may have been treated, they become incapable of holding plates—a knowledge of which fact generally comes to us when we are coating a large plate in a particular hurry, by seeing it slip off on to the floor. To remedy this state numberless dodges have been suggested, but all, to my mind, insufficient to attain the desired end. Spirit of wine has been recommended for the purpose of softening the hardness, and cyanide to dissolve the reduced silver; but all are utterly useless.

It is clear that nothing but a new surface will remedy matters, and, with this object in view, it is possible to obtain the rubber discs, and to put them in the place of the old ones; but this is troublesome. The screws by which they are attached to the framework are often next to impossible to remove, and the discs themselves are so comparatively expensive that I endeavoured to devise a simpler substitute. In this at last I have succeeded, and now I can practically, for about one penny, have a new holder as often as I like. This renovation consists simply in the attaching to the top a disc of thin sheet rubber (it can scarcely be too thin) by means of some india-rubber solution, such as is to be found in almost every studio. There is little difficulty in attaching it after one trial has been made; but at first it works very awkwardly, through the solution causing the pure rubber to give way and cockle and twist in all directions.

The plan I have found best has been to cut the disc to size carefully out of the sheet of rubber beforehand; then paste the holder itself thickly all over and press it evenly down upon the thin disc. If this be well done the holder will be ready for use in about an hour's time; but if too little solution be spread, or the operation be not speedily enough performed, the thin rubber will expand and curl at the edges to an extent that will make it almost impossible to uncurl it. A single trial, however, will put anyone in the way of making the repairs; and if this little hint be as serviceable to others as it has been to myself, I shall have added a very considerable wrinkle to the store to be found in this Journal.

G. Watmough Webster, F.C.S.

## FOREIGN NOTES AND NEWS.

Meetings of the Belgian Photographic Association.—New Photometer of M. Nagant.—Experiments with Coloured Collodion.—A Convenient Plate-box.—The Continuating Action of Light on Carbon Films.—New Type-Metal Heliographic Process.

The last number of the *Bulletin* of the Belgian Photographic Association (in which journal alone the meetings of the various sections are published) contains the reports of the meetings of the Brussels Section of the 6th March and 3rd April, and of the Ghent Section of the 20th April, from which we cull the following notes:—

Before the Brussels Section M. de Blochouse exhibited a pellicular negative upon a gelatine film transferred by the process of M. Rousselon, and measuring one mètre by fifty centimètres (about $39\frac{1}{2} \times 19\frac{3}{4}$ inches). These negatives require to be kept in a tight roll or under pressure, in order to avoid wrinkles.

M. Davreux laid before the members a new photometer recently introduced by M. Nagant. This apparatus is specially intended for the purpose of judging of the necessary exposure in the production of negatives, and consists of a long tube closed at the extremities by colourless glass, between which are inserted, by means of a suitable rod, a sufficient number of discs of blue glass to just render invisible the image of the object to be photographed when the instrument is applied to the eye of the operator. The quality of the light is judged by the number of discs required to obstruct the whole of the rays. It was remarked that, as far back as 1869, M. Del Marmol described in the *Revue Universelle des Mines* an instrument constructed upon the same principle, but differing slightly in its details. M. Del Marmol's photometer consisted of a box carrying at its extremities two blue glasses, and furnished with a movable lever bearing a series of additional glasses which, by turning the lens, could be inserted at will until the requisite amount of obscurity was obtained, the result being read off as in the former case. We think that some years prior to the date of M. Del Marmol's description more than one apparatus similar, if not identical, in principle saw the light of publication in the English journals.

M. de Blochouse gave an account, illustrated by specimens, of his experiments in connection with coloured collodions. Having to reproduce a very old picture of a deep yellow colour, he conceived the idea of staining the collodion the complementary colour, violet. Upon comparison of the results obtained with such a collodion and also an ordinary sample the stained film showed a much clearer and more vigorous image than the other. In reproducing an object of a pale blue colour a similar end was attained by the use of an orange-coloured collodion. He complained chiefly of the difficulty in finding colours soluble in the ether and alcohol, and which are not precipitated (?) by the water of the sensitising bath.

The same gentleman also called the attention of the members to a plate box of his invention in favour of which he made claims for simplicity and portability. Two pieces of wood are made to receive a series of parallel saw-cuts, in which are inserted strips of Bristol board. The racks thus formed, if we understand the description rightly, are inserted without fastening in a box of suitable size, the plates serving to retain them in position. A band of india-rubber is stretched at the bottom and also at the top of the box, so that the plates are supported on all sides. By this means a large number of plates may be carried in a comparatively small box.

M. Rommelaere read a communication from M. Montefiore-Lévi on the subject of the continuating action of light on carbon films. Instead of allowing some time to elapse between exposure and development, the author states that he produces the same effect by submitting the tissue, after a brief exposure under the negative, to the action of diffused light, and developing at once. Specimens were handed round; but the opinion of those present was that the prints treated according to M. Montefiore's method were lacking in vigour and degraded in the whites. In the course of a discussion which followed, MM. Rommelaere and Davreux expressed an opinion that the action of light upon a carbon film may be compared to a species of fermentation, which, once set up, continues to increase after the removal of the disturbing force. These two gentlemen undertook to conduct a series of experiments on the subject, and to lay their results before the members at a subsequent meeting.

No discussion of interest arose at the meeting of the Ghent Section, the sitting being occupied in the examination of a number of photochromic proofs by MM. Vidal and Ducos du Hauron, and also the new American stereoscope and a number of pictures by Messrs. Anthony, Bierstadt, and others.

A company has been established in New York to work a new heliographic process by which woodcuts are very successfully imitated in common type-metal. The plates produced by this process are said to be very good substitutes for woodcuts. They are very cheaply and quickly produced, by means of photography, on hard type-metal, which is then laid upon a mahogany block to be ready for printing along with any letterpress that may accompany it. The plates are printed in the same way as woodcuts, and from 50,000 to 100,000 impressions can be taken from one plate. The plates can be stereotyped or copied by the galvanic process in the usual way. They are *not* produced by etching with acid upon zinc or any other metal, and the lines are free from that torn and broken appearance so often observable in etchings.

The engraving of line-engraved prints and pen-and-ink sketches is done direct, but pencil sketches, photographs, and pictures with half-tones can only be copied indirectly. In a few minutes an enlarged photograph is obtained, which the artist covers with thick lines in the shadows and thinner lines in the half-tones; in this way the photographic tone is removed and a black linear original on a white ground remains. This is now ready to be photographed the required size on the metal plate. When desired, proofs of the drawing will be supplied at this stage before it is finally transferred to the metal plate.

Almost all woodcuts, copperplates, and lithographs can be reproduced in this way; but there is much greater difficulty in the case of steel plates. Twenty-four specimen prints produced by this mode—comprising landscapes, *genre* pictures, portraits, and animal pictures—were laid on the table at a late meeting of the Berlin Photographic Society, and have been favourably reviewed in the *Mittheilungen*. However, from all that we have been able to learn, this process seems more suitable for illustrating tradesmen's catalogues than for books or the reproduction of works of art.

## ON PHOTO-MECHANICAL PRINTING.

[A communication to the Photographic Section of the American Institute.]

The art of illustration has become a necessity, both for educational purposes and for objects of pleasure; a picture of anything in nature will give a better idea of the object than any word description, and any method by which it can be produced is a subject of interest, especially to photographers.

Photography is unrivalled for absolute truthfulness in its productions, and had the ancients been acquainted with this art in its present state of perfection they would have given us a clearer knowledge of the past than we can glean from their writings.

We have the art of catching a shadow and examining it at our leisure; let us see we make it so permanent that we may hand it down to posterity unchanged.

How often do we look over our collections of photographs for some well-known face or view, and find that what was once a beautiful picture is scarcely anything more than a piece of yellow paper with a few brownish spots where were once the deepest shadows, all the rest having vanished! No matter how carefully photographs are made, if they are produced chemically they can be destroyed by chemicals. No one can tell how soon a picture may be exposed to some element that will dissolve it. This fact has been known from the first discovery of the art of photography, and absolute permanence has been sought from the beginning, but found only in the use of pigments.

Pictures in permanent pigments may be safely handed down to posterity with a perfect confidence in the expectation that the shadow may be seen long after the substance has faded. This permanency is attained by means of some of the photo-mechanical printing processes.

"Photo-mechanical printing" is a term that can be applied to so many different methods of producing pictures that it is necessary to name a few of them before considering the one with which I am most familiar.

The "phototype," or "actinic" process, furnishes blocks which are printed from in the same manner as ordinary types. The relief is produced by the swelling properties of gelatine, from which an electrotype or stereotype is made, or a metal plate is etched with acid.

Photolithography comprehends that branch of photo-mechanical printing which produces impressions from lithographic stones by making transfers by photographic means. These two methods are rarely used for anything except line work.

Photozincography is similar to photolithography, using a zinc plate instead of a stone.

Heliography is a name given to various processes for plates which are etched and printed from in the same manner as ordinary copperplate.

The Woodburytype must also be classed with the photo-mechanical printing methods, although the ink used is gelatinous and not fatty, as in all the others named; this produces pictures in half-tone which cannot be distinguished from silver prints.

The photocollographic printing process is that which produces pictures printed from a surface of gelatine prepared by photographic agency; this will principally form the subject of this paper.

Gelatine, which forms the surface from which these pictures are printed, is made from the skins, sinews, bones, and cartilage of animals. Chemists tell us very little of gelatine, except the process for manufacturing it, and nothing about its photographic properties; but they tell us that some kinds contain *chondrin*, particularly that made from bones and cartilage, and we learn also that the precipitate formed by adding a coagulating material to chondrin is redissolved when added in excess, which is not the case with gelatine. There are two methods for manufacturing gelatine—one by means of boiling the materials under steam pressure, and the other by treatment with acids; the latter yields gelatine more soluble than the former. In practice we find that the most insoluble kind is best for a printing surface; from this we infer that for this purpose gelatine should be made without acid, and if we require perfect coagulation we must use the kind that has the least chondrin in it, which is that made from skins, parchment, and sinews.

From my experience with the various kinds of gelatine I would expect the best to be made of selected materials, purified or cleansed before manufacture, as any attempt at refining or clarifying after manufacture will be sure to remove some of the qualities which are essential to a good printing film.

The sensitive material in all cases where gelatinous solutions are used is bichromate of potash, bichromate of ammonia, or some chromic acid salt, the effect of which, when mixed with gelatine, dried, and exposed to light, is to render the latter insoluble, and by a prolonged exposure perfectly non-absorbent.

It is generally conceded that the first mention made of bichromate of potash in photography was by Mr. Mungo Ponton, who announced to the Royal Scottish Society of Arts, on May 29, 1839, that paper saturated with that salt, then dried and exposed to the sun's rays through a drawing of some object, would produce a yellow picture on an orange ground. To fix it all that was required was to immerse it in water to wash out the bichromate, and a permanent picture in white on an orange ground was obtained.

In 1840 M. E. Becquerel discovered that sized paper, when saturated with bichromate of potash, was more sensitive than unsized. In the same year Mr. Joseph Dixon, an American, astonished the inhabitants of Massachusetts, where he resided, by exhibiting reproductions of bank notes made with such fidelity as to defy detection, and which, he said, were printed from stone prepared by photographic agency. The details of his process were not made public until 1854, when they appeared in the *Scientific American* for April 15, page 242. He used gum arabic and bichromate of potash spread direct upon stone, and after insolation inked, washed, and etched as in lithography.

In October, 1852, William Henry Fox Talbot patented a photo-engraving process. After coating a steel plate with bichromated gelatine he impressed it with a photographic image through a negative by means of a copying-frame; then washed. The washing removed all the bichromate and the greater part of the gelatine from the portions of the plate upon which the sun's rays had not acted. After drying the plate was etched by a solution of bichloride of platina containing a little free acid and water; it was then printed from in a copperplate press.

Herr Paul Pretsch patented his process in November, 1854, which consisted of a surface coated with glue, nitrate of silver, iodide of potassium, and bichromate of potash. The subject to be copied was laid on this prepared surface and exposed to the light; after exposure the plate was washed in cold water until sufficiently swelled and then electrotyped, or the design was inked with printing-ink and transferred to zinc or stone, and lithographic impressions obtained.

We now come to the invention of Alphonse Louis Poitevin, which was patented in England, December 13, 1855. This inventor claims to have been the discoverer of the fact that a chrome-gelatine film impressed with a picture and dampened would receive greasy inks on the parts affected by light, although the fact must have been known to Paul Pretsch more than a year before; for he distinctly says, in his patent of 1854, that the chrome-gelatine "design was inked with printing-ink" and transferred to zinc or stone. In Poitevin's process, after inking, the film was retained with the picture on it, or impressions were taken in the lithographic manner. These impressions were probably the first successful attempts at producing half-tone of which we have any record; the half-tones in these prints were fair but not fine, and as very little was done with the process more than experimenting it is presumed that perfection was not yet reached. Excepting the repetitions of the experiments of Poitevin and a few others in the direction of photolithography, and the well-known carbon processes in which his pigments were mixed with the gelatine, we hear nothing further of any photo-mechanical prints in half-tone until 1865, when MM. Tessie du Motay and Maréchal, of Metz, in France, made an advance which was then considered wonderful. Their method was to coat metallic plates with gelatine and bichromate or trichromate of potash, or ammonia, and bichloride of mercury; then again coated with soaps of silver, exposed to light through a negative; then washed, inked, and printed from in a lithographic manner.

In a paper read before the Photographic Society of France, in May, 1867, M. Tessie du Motay says:—"A mixture of isinglass, gelatine, and gum, evenly spread upon a well-polished metallic surface and previously treated with an acid chromate, has been found to give the most satisfactory results. The ordinary chromate and bichromate salts are not suited to the purpose, as they do not impart sufficient sensitiveness to a mass of organic matter if the latter happen to be of a notable thickness, the photographic image being insufficiently developed and, therefore, imperfect. The alkaline trichromates, when used alone, are likewise incapable of producing perfect impressions, and it is only by adding a certain proportion of acid, or some body possessing a strong affinity for oxygen, as formic, gallic, pyrogallic acid, or even certain reducing salts, as hyposulphites, sulphites, bisulphites, hypophosphites, &c., to the trichromates, that a suitable compound is obtained. Trichromates of potash, in conjunction with bichloride of mercury, may likewise be used, as also chromo-mercurial salts; but by these means an image is obtained which produces negative prints, so that the photograph must be inverted if it be desired to obtain positive impressions. When treated with a reducing salt the trichromate, as also the chromo-mercurial salts, have the property of acting upon the composition of isinglass, gelatine, and gum when in contact with a surface of copper, rendering that portion of the compound which comes in contact with the metal perfectly insoluble—a result which is accelerated and more completely brought about by warming the film previous to its being flowed upon the metal plate. After coating the plate is exposed for several hours in an oven or stove to a temperature of 50° C. This operation is indispensable to the stability of the film, which otherwise is very liable to be injured by the scraper when the plate is passed through the lithographic press. After heating it is ready for exposure under a negative. Plates produced in this manner are capable of furnishing about seventy good impressions."

M. Tessie du Motay tells us here that his gelatine and chromo-mercurial salt solution becomes "perfectly insoluble" on the surface in contact with the metal plate; but in his patent specification he says that by long washing of these plates the action of light is reversed, so that the parts exposed to light become soluble. In printing the plates must be kept moist, which amounts to a "long washing," and of course the gelatine eventually becomes soluble. This may account for the small number of impressions he made from each plate.

M. Tessie du Motay exceeded all his predecessors in the quality and quantity of pictures produced from one plate; but the trouble in preparing them was too great to make the process a commercial success, yet it was tried and several works illustrated from it, in which the half-tints were very good.

Herr Albert had been experimenting for several years to discover a method of making durable films upon metal and stone, and saw that it was difficult to prevent moisture, which is indispensable in printing, from penetrating through a gelatine film. The addition of various hardening or coagulating materials, such as resinous gums, alum, tannin, &c., to the solutions had been tried; but it became evident that perfect insolubility was not to be attained in this manner, for long before a sufficient quantity is added the whole mass will coagulate and cease to be a fluid, and become unmanageable. He therefore abandoned the pursuit in this direction, and experimented on the plan of *forming* the film first and *hardening* it afterwards, and found that by immersing a plate covered with a film of gelatine in a solution containing a coagulating material the hardening was much more perfect than before; but, not yet satisfied, he desired the under side of the film to be *perfectly impervious* to moisture. At last it occurred to him that if the action of light made chrome gelatine insoluble, why not expose the under side of the film to the light, and thus secure the desired end? This, of course, required a transparent base upon which to spread the film; but as metallic plates and lithographic stones were considered the only things strong enough to sustain the required pressure for printing, it was some time before he could avail himself of this idea. He at length prepared a film upon glass, and found the liability to breakage much less than was anticipated, and instead of seventy impressions he made twelve hundred from one plate.

This solved the problem of durability, and established a principle upon which is based every successful collographic printing process now in use. Some continue to mix the coagulating material in the solution, and meet with fair results; but in such cases a thick film is used, which has the disadvantage of swelling so much when moistened that it is necessary to make a matrix of gutta-percha, or some similar material, to press the paper into the deepest places, that the ink may be all taken up.

The most perfect and durable printing plates should be perfectly non-absorbent on the under side, besides the insolubility throughout the entire film produced by coagulation.

As Herr Albert's process has thus far produced the most durable plates of all, it may be interesting to explain how this durability is best attained. E. Bierstadt.

*(To be concluded in our next.)*

# Contemporary Press.

## INFLUENCE OF PIGMENTS ON THE PHOTOGRAPHIC IMAGE OF THE SPECTRUM.

[Nature.]

When, some time since, Professor H. Vogel announced the discovery that the addition of a pigment to a film of bromide of silver made it sensitive to light of the colour which that pigment gave it, though it had not been so previously, many—indeed I might say most—photographic chemists doubted the accuracy of his observations and the existence of any such law. His experiments were rehearsed by most of them, and the reports were, in almost every case, contradictory of his conclusions. There were powerful *à priori* reasons for doubting, amongst which the chief was, in my own opinion, that if a film coloured (say) red were sensitive to red light it could not be developed under red light, but would fog, and would therefore be unworkable, which was not found to be the case. Another was that the use of tinted films, well known for a long time, had only resulted in an universal retardation of all colours. It was, moreover, contrary to the known analogies of actinism that a purely mechanical admixture, irrespective of any chemical quality, should produce changes of so purely chemical a nature as those which are the basis of photographic action.

By the kindness of Mr. Lockyer I was enabled to experiment at his laboratory at South Kensington with the same plates (Colonel Wortley's tinted films) that Professor Vogel had based his discovery on, and, as I expected, found the results quite other than those the Professor had announced. Although a protracted exposure (seventeen minutes) was given, and the more refrangible lines were quite buried by halation, no line was shown which did not appear in the ordinary wet collodion film.

That careful and excellent photographic chemist, Mr. Spiller, Vice-President of the London Photographic Society, Dr. van Monckhoven, Mr. M. Carey Lea, and numerous others—amongst whom I am enabled, by his personal assurance, to name Dr. J. W. Draper, unquestionably the first living authority on spectrum photography, as well as his not less well-known son, Professor Draper—have also followed Vogel in his experiments without obtaining any confirmation of his law.

Up to this time the only testimony confirmatory of his views offered is that of Becquerel, who, as the most marked instance of success, gives this—that chlorophyl (a green substance) gives great sensitiveness to *red* rays! That most indefatigable and precise experimentalist, Mr. M. Carey Lea (of Philadelphia, U.S.A.), in the course of a long series of experiments, unfortunately interrupted by his ill-health, showed that, while coralline in a film did add slightly to the length of the spectrum image other red pigments produced no effect whatever, and that salicine, which has no colour, produced more effect than coralline. But if chlorophyl, a green substance, is sensitive to red light, aniline green, so far as my own experiments go, produces no effect whatever except prolongation of the exposure necessary.

Now, without in the least disputing the prolongation of the spectrum photograph as claimed by Professor Vogel, or depreciating the importance of his results, it seems to me that we are in a position to assume that he is entirely mistaken in the nature of the law he deduces, and that these results are due to purely chemical causes, in nowise dependent on colour, though in a few cases the colour may coincide with the chemical cause in such a way as to afford apparent confirmation of his hypothesis.

It must be remembered that Dr. Draper has long ago shown that all the rays have chemical activity, and that he has, without any such aid as Vogel has called in, produced complete photographic spectra; and has also shown that different substances decompose under different rays. Becquerel's experience with chlorophyl gives a clue to the connection between these discoveries and Vogel's results, if collated with a series of phenomena resumed by Dr. Draper (from observations by Dr. Gardner) in the interesting papers by him on the *Distribution of Chemical Force in the Spectrum* *:—"In Dr. Gardner's paper there are also some interesting facts respecting the bleaching or decolorisation of chlorophyl by light. He used an ethereal solution of that substance:—'The first action of light is perceived in the mean red rays, and it attains a maximum incomparably greater at that point than elsewhere. The next part affected is the indigo, and accompanying it there is an action from + 10·5 to + 36·0 of the same scale (Herschel's), beginning abruptly in Fraunhofer's blue. So striking is this whole result that some of my earlier spectra contained a perfect neutral space from — 5·0 to + 20·5, in which the chlorophyl was in no way changed, whilst the solar picture in the red was sharp and of a dazzling white. The maximum in the indigo was also bleached, producing a linear spectrum as follows:—

in which the orange, yellow, and green rays are neutral. These, it will be remembered, are active in forming chlorophyl.' * * * * I have quoted these results in detail, because they illustrate in a striking manner the law that *vegetable colours are destroyed by rays complementary to those that have produced them*, and furnish proof that rays of every refrangibility may be chemically active." (Page 7, *Researches in Actinic Chemistry.*)

Dr. Draper goes on in this memoir to establish a second proposition to this effect:—"That the ray effective in producing chemical or molecular changes in any special substance is determined by the absorptive property of that substance." This proposition, laid down in 1841, seems to me to contain the explanation of all the phenomena of chemical or molecular change in photographic films; and if I might be permitted to offer an hypothesis supplementary to the proposition, serving, *if demonstrable*, as a corollary to it, it would be that, if two substances having different absorptive properties are simultaneously (or nearly so) subjected to the action of white light, in molecular contact the change in one of them may be communicated to the other mechanically. Thus, bromide of silver, which is not sensitive to the red ray, being placed in contact with chlorophyl, which *is* sensitive to that colour, the action of the red ray is communicated from the latter to the former substance, producing what may be designated as a sympathetic molecular effect. But in order that this may obtain it is necessary that the auxiliary substance applied to influence the sensitive photographic film should be in itself sensitive to other rays than those which decompose the silver bromide. This would account for the effect of chlorophyl and perhaps for the original experiment which attracted the attention of Professor Vogel, as the dry plates of Colonel Wortley with which it was made contain salicine in their preservative, as well as an aniline red in their substance, and Mr. Carey Lea has shown that salicine has the effect which Vogel claims for the colour.

If this be tenable it follows that the object of our researches should be to discover those substances which have an independent susceptibility to actinic action, but for different rays than those which form the basis of the film experimented on. The results so far obtained in this direction, even those of Vogel himself, are, it seems to me, quite as capable of explanation by the hypothesis I have offered as by that of an arbitrary effect of colour; in confirmation of which we have only experiments (thus far made public) by Professor Vogel himself.

It seems to me incredible that, if such a law existed, such careful and experienced investigators as the Drapers, van Monckhoven, Spiller, Carey Lea, and others who have repeated Professor Vogel's experiments, should utterly fail to obtain any confirmation of his hypotheses; and there is no solution in accordance with known facts and analogies of actinic action except to conclude with Dr. Draper that Professor Vogel has made a mistake—he has attributed to one of two coincident qualities of certain substances effects which are due to the other.

Dr. Draper records experiments in which he secured a photograph of the entire spectrum on a daguerreotype plate, by availing himself of the

* *Researches in Actinic Chemistry, Memoir Second*, &c. John William Draper, M.D., LL.D., New York.

singular reversing action of light on the impressed plate (pp. 2 and 3 of *Memoir)*, and allowing a diffused daylight to fall on the plate simultaneously with the spectrum image. "If," he says, "a spectrum be received on iodide of silver formed on the metallic tablet of the daguerreotype, and carefully screened from all access of extraneous light, both before and during the exposure, on developing with mercury vapour an impression is evolved in all the more refrangible regions.

"But if the metallic tablet during its exposure to the spectrum be also receiving diffused light of little intensity—as the light of day or of a lamp—it will be found, on developing, that the impression differs strikingly from the preceding. Every ray that the prism can transmit, from below the extreme red to beyond the extreme violet, has been active. The ultra-red heat lines $\alpha$ $\beta$ $\gamma$ are present."

The whole of this *Memoir* is of the greatest interest to the spectroscopic photographer, not only as giving the result of all previous experiment in this field, but in clearly marking out what remains yet to do in it. The subsequent success of the younger Draper in obtaining a negative of the spectrum complete by the ordinary collodion process, through the aid of an analogous system of protection by mechanical means for the lines most readily impressed, proves that even with silver, and under any condition of process, we have the power of recording any spectroscopic phenomenon; but if experiment should prove that substances in themselves liable to decomposition by rays which do not attack the salts of silver are capable of communicating an impression by molecular contact *to* the silver, and inducing decomposition in it, it is evident that a complete combination may be arrived at which, without mechanical contrivances, will give us printing negatives of the spectrum throughout. W. J. Stillman.

# Correspondence.

## ACTINOMETRY.

*To the* Editors.

Gentlemen,—That this is a department of our art-science as yet in a state but little advanced is patent to all who have given the subject a little attention. This may be accounted for by assuming that photographers, not seeing any immediate advantage in pursuing this subject, have left it to those whose inclination may lead them to those untrodden paths where the search for new truths is often rewarded. This assumption may or may not be correct; but at least the fact remains, account for it as you may, that but little progress has been made in this department of photography. It is my intention to point out a few of the rocks ahead in the track of those who may be inclined to follow up the subject.

I think I shall not be far wrong in saying that the generally-received impression is that a ray of sunshine is divisible into three parts, viz., heat, light, and actinism. The first we measure by a thermometer, to the second our eyes are sensible, and of the third we are made conscious by chemical action. In examining the solar spectrum we find these agents to have different degrees of refrangibility—heat being least, light more, and actinism apparently the most, refrangible. The first two being outside my present province I will leave them and take a glance at our means of measuring actinism.

It is found that under the influence of light certain bodies are decomposed, or so changed as to be susceptible of being decomposed, by agents that, without this action of light, would leave them unchanged; the amount of such decomposition being our means of measurement. These bodies, when exposed under the rays of decomposed light—such as is termed a "solar spectrum"—do *not* show any fixed point of maximum action common to them all. Each appears to have its greatest sensitiveness in a ray of a different refrangibility to any of its fellows; so that, instead of actinism being limited to any portion of the spectrum, it may extend with equal activity from end to end thereof. The researches of Dr. Draper show that this opinion is not quite so visionary as may at first sight appear; indeed, he demonstrated its truth. Hence we must lay down a law of no small importance—a law which in actinometry has hitherto been neglected—namely, that actinism is not confined to any portion of the spectrum.

What is generally looked upon as actinism are those rays which happen to affect certain silver compounds. A means of estimating the *total* chemical action of daylight has not yet been devised; all that has been done is but to determine the amount of energy present affecting certain bodies. In passing I may point out the probability of the chemical action of light depending upon the unison and non-unison between the wave-beats of light and the motion of atoms amongst themselves; and it is possible that, after making a bridge across space and letting us into the secrets of far-distant worlds, light may aid us by making clear some of those physical properties of matter the knowledge of which Dame Nature as yet withholds.

I have been examining this probability particularly in its relation to the latent image; but the time required is a barrier at present to any rapid progress. Leaving this, therefore, let us look upon the value of any standard sensitive body. That such is obtainable Dr. Roscoe proved; but that it is a standard for one substance only is obvious, when it is remembered that each compound hitherto found sensible to light exhibits a maximum point of sensitiveness in the spectrum differing from its fellows. I repeat that it is a standard for one substance only, unless, first, that equal amounts of chemical action produce on different bodies decomposed thereby equal shades of blackness, and the relation of tint be once and for all determined under an equal intensity of light; second, that the rays composing the solar beam always reach us in a constant proportion amongst themselves, that is, no conditions are ever present that filter out, as it were, more of one ray than another. The determination of these suppositions must be preliminary to any reliable method being fixed upon for ascertaining the total chemical action of daylight, and, should no better standard be found, the estimation of actinic power will always be a complex and difficult problem.

In the matter of a self-registering actinometer—a subject to which your talented correspondent, Mr. Woodbury, refers in your last number—I may say I had one in operation more than twelve months since, and described it in The British Journal of Photography in March last. In the early part of this year I undertook to produce a series of curves representing actinic power, and they appeared to show that such variation had some relation to barometric changes. However, I have ceased to use the instrument because I am unable to say it represents the total variation of actinic power. In the matter of bichromatised paper it was not thought to be so uniformly sensitive as chloride of silver in paper.

For one, I should like to see actinometry rescued from its present chaotic state, and to those to whom the pursuit of such a subject appears useless I would venture to say that there was a time when the investigation of the action of light on iodide of silver might have seemed objectless; yet upon it many fortunes have been built. In science a trifle will sometimes bear fruit abundantly; the falling of an apple led to the law of gravitation being discovered.—I am, yours, &c.,

*Halifax, August* 14, 1875. W. E. Batho.

## THE LAMBERTYPE PATENTS.

*To the* Editors.

Gentlemen,—You will perhaps pardon me while reminding you that the letter from M. Lambert—which you say must close the controversy—contains statements which you, in fairness to those who think he has not established his claim, must give space for reply; indeed, I am appealed to for answers to certain questions. To be as brief as possible, allow me to say that if I have now or previously omitted to reply to any statements it is simply because I wish to keep to the main question.

I deny that M. Lambert has the right to patent the use of semi-transparent paper on both sides of negatives, and I have proved that the use of such method was published long before the date of the patent; and as I have given dates for reference it is useless to say more on the subject. M. Lambert is only attempting to throw dust in our eyes in all he says to the contrary.

In reply to the statement that I have perverted "a written fact," allow me to ask whether it has not appeared in print that M. Lambert had said that the paper may be used on the *back* of the negative without infringement of the patent? If correct on this point what I have written is true.

As M. Lambert now claims the use of the paper on both sides of the negative, &c., &c., and as Mr. Croughton threatens to use this method (as he has a perfect right to do, in my opinion), the patent notwithstanding, and as M. Lambert says he shall defend his right "regardless of cost," let him bring an action against Mr. Croughton. I, for one, will gladly pay my share of the cost of the defence. Every photographer in England is interested in this matter, and ought to join to resist this attempt to deprive us of what is already public property. The quibble about "stumps" and pencils is too futile for further discussion.

It is difficult to see the connection between the matter of the Lambertype patent and the question M. Lambert asks—"Has Mr. Brothers never bought the exclusive agency?" &c. M. Lambert here evidently refers to a matter in which a Mr. *Lambert*-Sarony was concerned. I did *not* purchase the "exclusive agency" referred to. I was foolish enough to pay £10 for what proved to be no secret at all. Of course I did not know this till after the money was paid. I discovered just in time that the "dodge" was an old one; but I was very nearly paying £40 more for "exclusive" rights.

If M. Lambert desire it I shall be most happy to publish further facts; but perhaps Mr. Lambert-Sarony—whose address, also, was Greenwich, Kent, and who probably may be known to M. Lambert—may be able to enlighten him, save your readers' patience, and save also an exposure which might not be satisfactory in certain quarters.—I am, yours, &c.,

*Manchester, August* 16, 1875. A. Brothers.

*To the* Editors.

Gentlemen,—I have to thank you for the kind courtesy with which you have so readily admitted my plea for a final rejoinder to the letter on the Lambertype of last week.

Will your readers kindly look at the parallel lines following, and see if they think it looks like "evasion" on my part?—

| *Letter signed "Lambert" in last week's Journal:—* | *My answer:—* |
|---|---|
| "I have seen every one of Mr. Samuel Fry's negatives anterior to your patent, and must say that not one of them has paper on both sides with retouching on both sides." | The writer of this letter (Colton), who is employed on the Lambertype, left my employ, as I have proved by the wages-book sent to your office, on September 20, 1873—three months before Mr. Croughton's paper was read, and has never been in the house since! The statement is, therefore, absolutely untrue. |
| Perceiving Mr. Fry's object in coming, we only showed him, &c. | On my entrance I was told that M. Lambert had been very anxious to see me, and that on the suggestion of Mr. Jabez Hughes he intended to write by that night's post to ask me to come to Greenwich. |

—I am, yours, &c., SAMUEL FRY.
*Surbiton, August* 17, 1875.

[Certain matters introduced by M. Lambert in his letter last week appear to warrant Mr. A. Brothers and Mr. S. Fry in giving explanations which they consider necessary. In our desire to close this matter we have taken the liberty of publishing only a small portion of Mr. Fry's letter.—EDS.]

## CARBON PRINTING ON THE CONTINENT.

*To the* EDITORS.

GENTLEMEN,—By virtue of your kind appreciation, and that of others, of my labours my name has hitherto occupied an honourable position among those of the numerous persons who have contributed to make carbon printing practicable.

Having joined in the purchase of Swan's English patent, and worked it extensively, I found great difficulty in the manipulation of large proofs, the wet paper tearing under its own weight. I ultimately succeeded in mounting proofs upon plates of metal and glass, and many of such proofs have been publicly exhibited. I obtained, too, prints up to 4 × 3 feet.

I found that the insolated gelatine paper when soaked in water until it had assumed its greatest extension, but had not become saturated, would adhere to such a plate without the use of india-rubber, shellac, or any other cementing substance, and this with such tenacity that it required a repellent substance, such as stearine or wax, upon its face to prevent ultimate adherence.

I took out a patent for the invention, but not before submitting the provisional specification to persons most competent to judge of the novelty of my claims. A patent was subsequently granted to me in America after a most rigid scrutiny of my pretensions.

The process has been extensively practised, not only by my late associates of the Autotype Company, but by Mr. Sarony of Scarborough, Mr. Baden Pritchard of Woolwich, Captain Abney, Colonel Crauford, &c. It has been used in Belgium and also in Germany. It has been used extensively in France by M. Leon Vidal, of Marseilles, who, in 1870, published a little pamphlet calling the attention of his countrymen to its value, as proved by himself and M. Tessiere, the well-known *avocat* and photographic amateur of that city. In the month of February, 1874, on my way to Algeria, M. Vidal asked and obtained permission to use the invention for his projected work on photopolychromy, for which he had already prepared many thousand proofs.

In a pamphlet just published, purporting to be a *History of Carbon Printing*, Dr. Monckhoven takes upon himself to erase my name from the list of persons who have contributed by their labours to the progress of carbon printing, and thus at one blow attempts to deprive me of the reputation and honourable position which your suffrages had accorded to me.

Dr. Monckhoven's qualifications for the task he has voluntarily undertaken would appear to be that, among his many unfortunate photographic speculations, always announced to the photographic public with much sound of trumpet and beating of big drum, he has never tried a single experiment, or discovered a single fact worth recording, on the subject in question. On the other hand, he has announced that he is about to commence the manufacture of pigment paper and articles for the use of carbon printers in Belgium, and as the existence of my patent there may seriously affect his commercial operations, it is obvious that he is at present more directly and personally interested in annulling that patent than, probably, any other man in Europe.

I know this because he applied to me through a common friend, a few weeks ago, to know if I would communicate to him the formulæ and apparatus *(moyens)* for manufacturing the autotype papers. I received an intimation about the same time that Dr. Monckhoven's means were not superabundant. Now, was this demand and appeal *ad misericordiam* made to a man whose reputation and property he was about to attack, or is the attack the consequence of my refusal?

Dr. Monckhoven as an historian is as unfortunate as he has proved to be in his photographic speculations. I might treat this so-called "history" with the contempt it deservedly received, I am assured, from the Societé de la Photographie Française, who refused to receive it, treating it, I am told, very properly, as a trade circular. Our old proverb, however, says that "of mud thrown some is sure to stick," and as this is one of the dirtiest handfuls of mud ever thrown at a man's good name, I will give one specimen of Dr. Monckhoven's manner of writing "history" in the hope of neutralising some of that dirt.

Dr. Monckhoven states correctly (page 18) that Mr. Swan, when he mounted his prints upon a permanent support, used albumen or starch, and when the former he rendered it insoluble by means of heat or alcohol. He then proceeds to attribute to Mr. W. H. Davies—who published an article on carbon printing in 1864 *(Bulletin Soc. France,* page 273) in which article reference is specially made to Swan's process—a *serious* and *capital discovery!* It is that before mounting his exposed print upon *uncoagulated* albumenised paper he dipped the print for one minute in water and then applied it to the albumenised surface, which he afterwards rendered insoluble by means of alcohol!

Now, to carry out the process of Swan, what else could he do but wet either paper or print, without which the colloid body would not adhere? Had Mr. Davies known the fact I discovered subsequently, namely, that the print would adhere to the albumen even after it had been coagulated, he would have saved his alcohol, which is tolerably expensive even when methylated, and would have rendered his albumen insoluble by means of steam.

Dr. Monckhoven then proceeds to garble Mr. Davies's paper in a manner which I will leave your readers to qualify. I place the quotations side by side:—

| *Monckhoven.* | *Davies.* |
|---|---|
| "Pour le double transport M. Davies, au lieu de papier albuminé, prend un papier revêtu de gomme laque dissoute dans le Methyle. Il y fait adhérer le papier insolé, qu 'il developpe et transporte alors l'image sur papier. L'image est *ainsi redressé*—auquel support provisoire il tient par adhérence atmospherique—découverte encore réclamé par M. Johnson." | "Si l'épreuve a été tirée d' apres un cliché ordinaire elle est renversée; et si on désire qu'il n'en soit pas ainsi, il faut un peu modifier la maniére d'opérer. Il prends alors au lieu de papier albuminé, une solution étendue de gomme laque et de térébenthine de Venise dans l'alcool methylé, et je fais adhérer la surface impressionée avec une feuille de papier ordinaire *en interposant, entre les deux feuilles, une couche de cette solution,* passant *le tout à la presse, laissant sécher,* et continuant comme je l'ai dit pour le papier albuminé. Apres dévelopment je sature d' alcool methylé une feuille de papier buvard ayant les mêmes dimensions que l'epreuve; je mets cette feuille en contact avec la deuxième feuille de papier, et je laisse le tout pressé entre deux glaces pendant un quart d'heure environ (to detach the print from the gum lac)." |

It is evident that Dr. Monckhoven leads his readers to infer that the paper serving as a temporary support had been previously rendered impermeable by a stratum of gum lac, and that the exposed gelatine print was applied by water as in the case of the albumenised paper. But Mr. Davies says that the cement or varnish was applied as a liquid between the surfaces, which were then pressed together; and, if so, we know that the gelatine print had not been wetted or it would not have adhered, the water precipitating the resins in solution as an insoluble, inadhesive mass. Again: if Mr. Davies knew that the sheets would adhere by atmospheric pressure why use the liquid cement between their surfaces?

Mr. Davies's communication was made originally to the Edinburgh Photographic Society on July 6, 1864. I quote the French version to show that Dr. Monckhoven's perverted history is not due to misunderstanding the language of the original communication. I have not the pleasure of knowing Mr. Davies, but I am sure that he will bear me out when I say that his process was a modification of Swan's, and that at that time he was unacquainted with the fact that no cement was required to hold the print upon an impermeable surface during development.

I put side by side the three processes for obtaining non-inverted prints:—

| *Swan's.* | *Davies's.* | *Johnson's.* |
|---|---|---|
| After exposure. | After exposure. | After exposure. |
| 1. Layer of caoutchouc between print and temporary support, to effect adhesion. | 1. Layer of solution of gum lac and Venice turpentine between print and temporary support, to effect adhesion. | 1. No cementing compound to effect adhesion. Thin stratum of stearine or wax, to prevent ultimate adhesion. |
| 2. Passage through press. | 2. Passage through press. | 2. No passage through press. |
| 3. Development, drying, and application of second transfer paper. | 3. Development, drying, and application of second transfer paper. | 3. Development, drying, and application of second transfer paper. |
| 4. Application of benzine to separate print from temporary support. | 4. Application of blotting-paper soaked in alcohol, to separate print from temporary support. | 4. No solvent required. Print falls off when dry. |

Your readers will judge by this specimen of Dr. Monckhoven's qualifications as an impartial historian; and when I tell them that I have a lawsuit pending which was expected to be tried a few weeks ago, that his work was prepared and kept unnoticed in France and intended to be sprung upon me, and produced in court to bias the judges as the report of this disinterested expert—the process of Mr. Davies having been carefully omitted from the "conclusions" of, that is, the matters to be produced by, my adversaries—they will see that Dr. Monckhoven is evidently acting in concert with, or has more probably lent his name to, the clique with which I am contending here; and with whose proceedings I will on some future day amuse your readers, unless proceedings, before a well-known court, threatened by their dupes should have forestalled me.—I am, yours, &c., J. R. Johnson.

*Paris, August* 16, 1875.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

W. G.—We are making inquiries.

J. Nesbit.—Received. In our next.

Amicus.—Mr. Henry Collen is alive and well, and at present resides at Brighton.

Tyro.—Methylated spirits is composed of nine parts of spirits of wine and one part of wood spirit.

M. and Co.—At present we must decline offering advice respecting the subject of your inquiry.

Baynham Jones.—The idea is a most excellent one, and we shall endeavour to follow your example.

S. M'L.—It is difficult to suggest in what way you could take more care than you have done. One remedy only can we suggest—write to the maker.

Old Tom.—To fill the position to which you aspire a knowledge of art is absolutely necessary. Without that you would be a mere manipulator and—"nothing more."

A Perthshire Farmer.—We have not yet tried the salt as a polarising subject, but we are intimately acquainted with the appearance of one of nearly the same kind.

W. E. B.—Up to the time of going to press we have not had an opportunity of searching our back numbers for the information requested. This we hope to do before our next issue.

Troubled One.—The spots on the paper arise from a want of perfect cleanliness in some of the operations, and is not due to the paper. By care you will easily find out where the hitch lies.

H. B. Berkeley.—So long as the liquid is of a red colour, showing excess of iodine, it is quite safe. We shall investigate the subject on our return from the meeting of the British Association.

E. L.—We have no objection to examine and give our opinion of the camera, provided it is sent to our office for that purpose; but it is not expedient for us to go to the place named in order to do so.

W. N.—We cannot give the name and address of anyone who would undertake to mend and reproduce the broken positive. By sending it to any dealer with whom you have business relations it might probably be accomplished.

B. P. L.—Do not forget that by the immersion of each plate the strength of the silver bath becomes reduced. Make an eighty-grain solution, and add a small quantity of it every morning to the bath. This will keep it up to the proper strength.

Gwenllian.—In saying that a lens of that kind had been used by Mr. Archer the speaker was guilty of making a statement at variance with fact. The person named is not recognised as an authority in either the art, the science, or the history of photography.

J. P.—The prints are bad from over-exposure in the printing-frame. Send the negative to a professional printer, and instruct him to return it along with the very best print he can obtain from it, and then use that print as a standard up to which to work.

Captain Gubbins.—The flocculent substance is metallic silver. By washing it in several changes of water it may be dissolved in nitric acid and will form nitrate of silver. It would be impossible to carry out the idea mentioned in the P.S. to our correspondent's note.

Erratum.—In the pleasant descriptive article in our last, entitled *Rambles and Recollections of an Amateur Photographer*, a slight error occurs. In column 2, page 390, 4th line from top. For "minute quantity of nitrate of silver," *read* "minute quantity of nitrite."

X. A. X. B.—1. See the advertisement of the Liverpool Dry Plate Company. —2. An ordinary plate-box will answer, provided it be well varnished.—3. The fixing is effected either by cyanide of potassium or hyposulphite of soda. You will be safe enough in making the purchase contemplated.

N. N. S.—The action is as follows:—The nitric acid leaves the nitrate of lead and combines with the iron, the sulphuric acid with which it was previously combined leaving it in favour of the lead, and thus producing a new substance insoluble in water. The sulphate of lead being removed by filtration leaves nitrate of iron in solution.

The Woodbury Process.—In reply to the hint given by the "Peripatetic Photographer" that the Woodbury process, as recently described by Mr. Winstanley, differs in some essential particulars from that process as now carried on, Mr. Winstanley says:—"My papers on the relievo process are not supposed to apply to the process as it *is*, but, as I have already said, to the process as it *was*, and, I may add, as it was in 1866. The details of the method as it is your readers are not likely soon to get, and if they got them I do not think much would be added to what they have already had."

F. S. F.—The three adjusting screws are quite a mistake. Let the triangle come into close contact with the bottom of the camera, and adjust the level of the camera by means of the legs of the tripod. The camera stand we use for field work possesses special facilities for adjusting the level by the lengthening or shortening of any of the legs.

Rev. T. G.—The "curious phenomenon" observed and described (very intelligently) by you is explained by the lens not being actinically corrected. The yellow or luminous rays which form the visible image do so on a plane slightly separated from that on which the chemical rays are made to unite; hence visually-sharp focussing does not ensure a sharply-defined photograph.

Edwin Scott.—It was somewhere about 1838 that notice was first directed by Mr. Ponton to the action of light upon bichromate of potash in contact with organic matter. At that time M. Poitevin had not entered upon those researches which have since made his name so justly famous, but about sixteen or seventeen years afterwards he (M. Poitevin) had obtained his first patent for a process based on the action referred to. Verily, as you observe, "there were giants in those days;" but we have not the least doubt that the same will by future historians be said, and most deservedly so, of the present time.

X. Y. Z.—As we have a few transparencies of the kind about which you inquire in our office at present, we suggest to you to call and see them. They were all obtained by the method to which reference was made, viz., developing fully by the alkaline process—this is essential—and then being subjected to an application of diluted nitric acid, by which the whole of the silver forming the image is entirely dissolved. After washing off the acid you have merely to apply the developer previously used, the plate in the meantime having been exposed for a few seconds to light, when a vigorous transparency will be the result.

Fine Photographs from Ugly Faces.— Mr. J. W. Husher, speaking of understanding and of having the picture in mind before he made it, said, at the last meeting of the N. P. A. of America:—Suppose one had a very ugly face to take, how would he make a beautiful picture out of it? Would he do it by retouching or manipulating the negative after making the impression by the camera? If he did, he would fail in reaching the point that we have in view as artists in making correct photographs. I do not know whether he had this idea of retouching and working it up, but it struck me in that way, and I simply throw it out, as has been done by some here this morning; and perhaps this afternoon, in reference to lighting the sitter, and in reference to making the best negative with the camera, and if you fail there in one instance, if you over-time, if you under-time, if you over-develope, or if you fail to get a right lighting, try it again—that has been my motto. I think it is the only correct position we can take if we undertake to succeed and improve in the art of photography. If we fail in getting the light we want, if we do not get the position to produce the most pleasant effect of lighting, we should try it again. My motto is—"try it again," like the shoolboy. "And if you don't succeed, try again," until you get the best possible effect that can be produced on that subject in the negative, and then if there are any improvements that can be made without destroying the likeness, do that with a pencil, as was suggested here this afternoon. Taking the pencil and attempting to fill up or build up is something which there are very few of us can do, or have the artistic hand or eye for the work; for I believe it takes a very different eye and a very different hand to retouch a negative and make it just what it should be from that which would make a negative what it should be or what is possible in the camera. Some people and some artists will take a brush and paint a good picture of some animal on the wall, but when they paint the picture of a human face they fail, because they have not the art to carry out or keep up the likeness. They cover it all up, and make a caricature instead of a picture.

## METEOROLOGICAL REPORT,

*For the Week ending August* 18, 1875.

Observations taken at 406, Strand, by J. H. Steward, Optician.

These Observations are Taken at 8.30 A.M.

| August | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 12 | 29·88 | SW | 63 | 66 | 72 | 62 | Cloudy |
| 13 | 29·72 | W | 62 | 64 | 76 | 61 | Raining |
| 14 | 30·06 | W | 61 | 63 | 79 | 61 | Dull |
| 16 | 30·10 | S | 66 | 72 | 87 | 62 | Bright |
| 17 | 29·99 | W | 62 | 70 | 85 | 65 | Bright |
| 18 | 30·11 | W | 61 | 67 | — | 63 | Cloudy |

CONTENTS.

# THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 799. Vol. XXII.—AUGUST 27, 1875.


## M. LAMBERT AND HIS PROCESSES.

Having closed the controversy on the originality and legality of M. Lambert's claims we take occasion to regret the personal feeling that has been imported, and also the opportunity lost of discussing the usefulness of M. Lambert's processes. There is a well-known saying that the value of a patent is not known until tested in a court of law; but while our pages are useless as a legal arena, they are the proper place to discuss the merits of all photographic novelties, whether patented or otherwise.

There are so many good things promised by M. Lambert in his advertisements that we are sorry the discussion, so far as it applied to his processes, was concentrated on the question as to whether he had not been anticipated by Mr. Croughton on one particular detail, while the major part of his claims was ignored. M. Lambert, as a foreigner, was doubtless unprepared for that curious feeling of hostility with which inventors are assailed if they attempt to turn to profit any discovery or improvement they may originate. Photography in all its ramifications is as legitimate a field for obtaining profit as any other art or industry.

If it be admitted that some persons may earn money by the exercise of their skill in taking portraits, producing views, or illustrating books, why may not others as legitimately obtain profit by inventing improvements? But a patent to a photographer is as a red rag to a bull, and the patentee is a common enemy to be fought instead of a friend to be courted. A lens or a camera may be patented without much ill will; but if a process be discovered, or improved to the extent fitting it for a patent, the patentee immediately becomes obnoxious. Yet no part of photography needs so much improvement as its processes; its future depends on their extension. Many men can utilise inventions that they are unable to discover; others can invent but, from want of business habits or otherwise, cannot turn their inventions to account. True wisdom consists in encouraging the latter class, and the patent law is the legal machinery to combine the interests of both these parties.

Nothing is more common in opposing patented and other claims than the revival of a dead and buried process to show that, in some other manner and for a different purpose, a portion was used that bears similarity to the new claimant, and that, therefore, the latter is an impostor. This was the form of the objection in the recent controversy, when it was sought to be shown that M. Lambert, by using paper on each side of his enlarged negative and working on each side, had been forestalled by Mr. Croughton, who, in a paper read before a metropolitan society in 1873, had incidentally alluded to an expedient that he adopted, in certain cases named, of also using a paper on each side of the negative; but, as he used these papers for a different purpose and in a different manner, the use of the two papers by both parties can only be regarded as a mere coincidence.

Among the mass of correspondence that we have been compelled to exclude there is one letter signed "A Licensee," in which this coincidence is alluded to and its unimportance pointed out. As, however, such an exaggerated value has been attached to this coincidence—to the extent that M. Lambert's process is claimed to be the invention of Mr. Croughton—we will extract a portion of the letter in which this claim is demolished; for if the two can be shown to be dissimilar they cannot be the same:—

"Mr. Croughton, for example, makes his transparency from the negative by wet collodion; M. Lambert makes his by carbon. Mr. Croughton uses the enlarging camera; M. Lambert uses the printing-frame. Mr. Croughton always makes his transparency very much larger than the original negative; M. Lambert makes his the same size as the original negative. Mr. Croughton intensifies with bichloride of mercury his enlarged silver negative; M. Lambert does not intensify his small carbon negative, but, on the contrary, he employs a special tissue so as to produce a weak image of a pale actinic colour. Mr. Croughton varnishes with matt varnish his large intensified transparency so as to enable him to work freely on it; M. Lambert does not varnish his small weak carbon transparency. Mr. Croughton works up his transparency as much as is necessary so as to produce a still *further* enlarged negative that shall require no retouching; M. Lambert does no retouching whatever on his small carbon transparency. Mr. Croughton uses his enlarged, dense, silver, worked-up transparency to make his larger negative, thus making his final enlargement by two stages; M. Lambert uses his small, weak, untouched carbon transparency to make his large negative, thus making only one stage. Mr. Croughton uses the camera and wet collodion in both operations; M. Lambert uses them only in one of the operations. Mr. Croughton from his dense, worked-up, silver, enlarged transparency makes a strong printing negative that shall require no retouching; M. Lambert from his small, weak, untouched carbon transparency makes his enlarged negative, and, intentionally, makes it so weak and thin that it is of no use unless it be worked up. At this stage all Mr. Croughton's work is done, if his work have gone well; at this stage all M. Lambert's work is to begin, no matter how well his work has gone. Mr. Croughton applies all his attention to working on his enlarged transparency; M. Lambert applies all his attention to working up his enlarged negative."

Thus far the processes are as diverse as two can very well be, seeing that they each have the same end; but it is at this juncture that the coincidence occurs on which the advocates of Mr. Croughton rely. In his paper Mr. Croughton says that as an "expedient," and in order to soften the printing, he strains tracing-paper on the face of the negatives of "elderly people" to "soften the lines and texture of the face." He does not say that he does this on all of his negatives; but, as he mentions "elderly people" only, the presumption is that for those who have not the lines and texture of the face "too marked" he would omit this "expedient." He studiously avoids saying that he "touches" or works on this paper on the front of the negative. He also places tracing-paper on the back to soften the printing and "to put in the high lights."

On this coincidence Mr. Croughton relies, and ventures to call M. Lambert's process his own—processes that up to this point have scarcely anything in common. Does Mr. Croughton suppose that so old a "dodge" as putting tracing-paper at the back of negatives so as, by pencil and powder colour, to form not only "high lights," but also clouds in landscapes, to "stop back" dark faces in portraits, under-exposed foregrounds, and dark corners in interiors, was reserved for him to discover in December, 1873? As well may he claim to be original in placing paper between a hard negative and the print—an "expedient" as old as the amateur days of the late Sir David Brewster. We have seen M. Lambert place his sheets of mineral

paper—a different material to tracing-paper—on both sides of his enlarged negatives, and his purpose was very different than to merely soften the printing of hard lines and coarse texture of traces—which, by-the-bye, it will not do—but it was to form, as it were, supplementary films better adapted than collodion on which to complete the formation of the negative; that is, to intensify it. Everyone knows that a thin, enlarged negative is more delicate and has finer modelling than one intensified in the usual way; but everyone also knows that such a negative will only yield a weak, worthless print, and that, even at the risk of coarseness, it must be intensified.

Here, then, steps in M. Lambert with a new idea; his negative at this stage has all the drawing, but scarcely any of the required intensity. Instead of intensifying the image itself, which would make it coarse, he intensifies the paper which covers it, giving general intensity on the back and the finest intensity on the front. This novel intensity is not only not coarse, but it modifies the coarseness already existing in the original negative. As our correspondent remarks in a further part of his letter, "it is a new principle in making enlarged portraits that M. Lambert introduces whereby he *intensifies* his intentionally thin negative with blacklead powder by the aid of stumps, using the back of the negatives for general effect—the masses, as M. Lambert has it—and on the front he does the finer work."

The "high lights," that Mr. Croughton says he puts on the back, M. Lambert never puts there—they would be lost; he always puts them on the front. All who have worked the Obernetter "dusting" process know what intense printing power plumbago has. M. Lambert avails himself of this, and by using the original thin silver negative as a tracing he builds up his negatives on both sides with blacklead, which, having no texture of its own, unites with the fine grain of the mineral paper and kills the offensive texture that exists in the enlarged silver negative. The real printing power of the negative is due to the two outer surfaces formed by blacklead powder, for the silver film is practically useless for mere printing; its chief service is as a guide for drawing and modelling.

The essential and indispensable condition to form a Lambertype negative is to start with a thin, phantom, enlarged negative. It is only bare justice to M. Lambert that this should be most emphatically stated. As a matter of photographic interest it is right to make very clear the curious manner in which these beautiful enlargements are produced. In some of these portraits, where the original silver negative has been of the most attenuated character—that is, in the best condition—the high lights have a charming stippled effect, giving the effect of days or weeks of labour; and yet there is no stipple whatever. It is caused by the blacklead being entangled in the fine grain of the mineral paper on both sides, and these, printing through and intersecting each other, give this artistic effect. The rich blacks of the shadows are produced by the almost bare glass of the original negative; the fine texture of the paper, having little or no blacklead on the shades, offers so little obstruction to the light that it does not show there.

Thus it is that M. Lambert is enabled to produce, as he did in our presence and in a very short time, an enlarged negative copied from a *carte* print to nearly life size, in which there was not only none of the coarse texture of the original paper print, but an absolute fineness that the original print never possessed. An untouched print from this enlarged negative has been on view for some time at our office, and is still there.

We have no desire to say anything depreciatory of Mr. Croughton's method of working or of his skill; but we venture to say that it is literally impossible by his plan, and in the same time, to produce anything like the enlarged print we have just referred to, and which we have described before.

We had intended, in the interest of the photographic community, to have spoken of other portions of M. Lambert's processes than that designated "Lambertype." These remarks we shall reserve until next week, meanwhile definitely expressing our opinion that in the way of producing enlarged portraits he is no mere copyist of an old process, but that he has introduced a really new principle in making enlargements without offensive coarseness and texture. To state that some skill and a little practice is necessary is only to say what is true of all processes. M. Lambert is principally a photographer, but it is fortunate for him that he is somewhat of an artist, as he can personally illustrate what can be done by his process. We see no reason why any skilful retoucher, especially if he be a photographer also, may not only do as good work as M. Lambert, but even a great deal better.

## THE PRINTING BATH.

If we were asked by a photographer in what way he could most profitably employ an occasional leisure hour, the best advice we could give would be to spend it in looking over the back volumes of the photographic journals. There the professional man would find many valuable hints and much useful information that have been forgotten; the amateur would learn much from the discussions originated by the introduction of processes with which he is now familiar; and the experimentalist would get many suggestions as to the directions in which he might exercise his inquiring turn of mind in matters which, though failures at the time, might in the clearer light of the present day be turned to useful and practical account.

In the course of such occupation we recently fell in with the discussion carried on so keenly ten years since on the question of the utility of adding nitrates of soda or ammonia to the printing bath; and, being anxious to ascertain as far as possible the effect of such a discussion after the lapse of so long a period, we instituted an inquiry amongst our friends with the view of ascertaining how far the system had been practically found worthy of adoption. The result of such inquiry has been to elicit the fact that of sixteen photographers, each in the possession of a tolerably large professional business, only two continue to use baths of sixty grains or upwards—as was the general practice at the period when the discussions to which we have alluded took place—the remainder finding forty grains, or even less, to give prints in every way satisfactory. Of the fourteen no fewer than nine use either nitrate of soda, potass, or ammonia. All speak very highly of the beneficial influence of the addition, attributing to it not only the production of more brilliant prints, but crediting it with securing immunity from discolouring of the bath, which so frequently occurs even with strong solutions.

Now, as this precisely tallied with our own opinion—arrived at from the sensitising of a few quarter-sheets occasionally—we were anxious to put the matter to a somewhat more careful test than we had found it possible to do hitherto, and as we recently had occasion to print more extensively than usual we took advantage of the opportunity to carry out the purpose indicated.

Three baths of twenty ounces each were prepared—one containing sixty grains of nitrate of silver per ounce, another thirty grains of that salt and the same quantity of nitrate of ammonia, and the third with thirty grains only. On each of those baths we sensitised eight quarter sheets of paper, floating for exactly one minute, and drawing the sheet across the edge of the dish to remove the excess of liquid. When dry they were printed in diffused light, each set of papers under the same four negatives, which were very much alike in density and general printing qualities. A careful examination of the finished prints showed that between the strong bath and that containing nitrate of ammonia there was very little, if any, difference, although the paper sensitised on the latter printed in at least a third less time, which is in itself a considerable gain. The print from the weak bath without the ammonia salt was much flatter and did not tone so easily. The operation was repeated with another batch of twenty-four quarter-sheets with a somewhat similar result, except in the case of the weak bath without nitrate of ammonia, the prints from which were mealy and unsatisfactory.

On preparing to repeat the experiment a third time the strong and weak solutions of plain silver were found much discoloured, and, therefore, before proceeding to decolourise them, we decided to ascertain precisely, by careful measurement and chemical test, what quantity of silver had been taken up by each sheet. The result of this examination showed that the actual expenditure of silver on a sheet $17 \times 22$ inches was in the strong bath thirty-two grains, and

in the weak bath twenty-three, or nearly thirty-three and a-third per cent. less; while in the case of that containing nitrate of ammonia the finished result was in every way as good, the printing quicker, and no tendency to discolouring of the solution. The next set of sheets sensitised were fumed with ammonia in the ordinary way, the result being a marked improvement in all the three samples, but much more marked in that floated on the nitrate of ammonia solution —so much so, indeed, that we do not understand how any person who has made a trial could be induced to relinquish the method.

Although perfectly satisfied with the accuracy of the results deduced from our experiments we have since visited the establishment of a professional printer who uses nearly two quires of paper per day, and who, we were aware, had long ago adopted the use of nitrate of ammonia, a weak solution of silver, and fuming, and whose work is generally admitted to be of the very highest class. He assured us that an examination of his books demonstrated that since the adoption of his present system of printing his expenditure for silver had been reduced by fully fifty per cent.; his printing occupied only a third of the time previously required, while the work done was quite as good as he had been able to do previously. His bath, which measures five pints, is kept in a wide-mouthed bottle, which just holds it. When about to sensitise, about four parts of this is poured into the dish and sufficient paper floated for the work of the day. The solution is then poured back into the bottle, which is filled up with ordinary water, in which has been dissolved one ounce of silver for each quire of paper that has been floated, a few ounces of nitrate of ammonia being added once a week.

Our friend's arrangement for fuming is very perfect. It consists of an upright box with a lid at the top and a drawer at the bottom, both made to close nearly air-tight. On lifting the lid the box is seen to contain twelve grooves, in which slide wooden frames very much like the frames of ordinary school slates. On these are pinned the sheets of paper, which, not being curled up, are not liable to the unequal fuming sometimes complained of. The drawer contains a quantity of cotton-wool, on which is poured about an ounce of stronger ammonia, and the action allowed to go on for fifteen minutes, more or less according to temperature. Such a box costs only a few shillings, the filling it with paper and applying the ammonia will take less time than it does to describe it, and the beneficial effects are so great that we confidently recommend it for adoption to all who really aim at the highest class of artistic work.

In conclusion: we would sum up the matter in a few words. Notwithstanding the ridicule which was showered upon the proposal to use a weak solution of silver, aided by a quantity of either soda or ammonia nitrate, ten years back, the system has been very largely brought into use in various parts of the country, and its advocates claim for it three great advantages, which are, or should be, of paramount importance to all photographers, namely, a considerable saving of silver, a large reduction of the time occupied in printing, and a finer and more brilliant result in the finished print. Our experiments made recently, as well as our experience for a considerable period, seem to prove that the claim is well founded, and therefore we heartily commend the method to the attention of all who have not yet given it a trial.

## THE ORGANIC REACTIONS OF PYROXYLINE.

During the last quarter of a century pyroxyline has formed the subject of the researches of numerous *savants*, and many new facts have been added to the list of those previously known. Hundreds of formulæ have been published for the preparation of pyroxyline of different qualities and for special purposes, and yet, after all, we seem to be as easily overcome by new difficulties, and to know little more of the properties of the substance in question than we did five-and-twenty years ago.

The question exercising the public mind at the present day is as to the properties necessary in a sample of soluble cotton in order to enable its use in the preparation of a washed emulsion. The almost general complaint is of want of density, and in very many cases the cause is only too well founded. With certain samples of pyroxyline nothing could be easier than to produce good results by the new process, while with another sample, which probably works equally well in ordinary emulsion work, no coaxing or manœuvring will ensure success when it is used as a washed emulsion. The cause of this difference of behaviour is hard to discover—doubly so when we consider that the treatment to which the emulsion is subjected is, in a chemical point of view, identical in each case; but it will be remembered that on the first introduction of the collodio-bromide process the same complaint of lack of density was urged against it—that a sample of bromised collodion which was found suitable for use with the silver bath was, perhaps, found wholly unsuited to the requirements of the new emulsion. In attempting to trace an analogy between the two cases we shall have to allude to some of the organic characteristics of the substances known under the generic name of "pyroxyline."

In the first place, that substance is known to be formed by the action of nitro-sulphuric acid upon cellulose or lignin, and was at one time considered to be a definite compound, capable of being expressed by a formula; but subsequent research has proved the futility of such an idea. It was very soon discovered that the ultimate character of the pyroxyline was entirely dependent upon the nature of the treatment which the cellulose was made to undergo. To such an extent was this found to be the case that it was possible to prepare a sample of gun-cotton possessing in the highest degree the properties of an explosive while it was almost entirely insoluble in the alcohol-ether mixture; and, on the other hand, a sample suitable for photographic purposes possessed comparatively little explosive force. Between the two extremes, by variations in the strength and temperature of the acids employed, an almost endless range of character may be obtained.

Numerous attempts have been made to explain the causes of this difference of result, and it is now known that other substances besides pyroxyline are formed by the action of the acids, but what those substances are has never been definitely determined. Mr. Hardwich, who was the first to take up the study of gun-cotton for photographic purposes, expressed an opinion that in the powdery samples, made at a high temperature, the action of the acids upon the cellulose brought about the formation of a small proportion of nitro-glucose—an idea which still holds ground in very many quarters. In so complicated a reaction as the one under notice it is difficult to reason by the strict rules of chemistry; hence, without attempting to combat the correctness of this view, we will direct attention to one or two points which would seem to negative such a result.

Nitro-glucose, it is well known, is the product of the action of *strong* nitro-sulphuric acid upon dried cane-sugar in the cold. The principal elements of success in this preparation are the absence of any increase of temperature and the most perfect freedom from water of all the substances employed. Now, in the manufacture of photographic pyroxyline both these conditions are wanting; the acids are weak, the temperature high. In addition to this we commence the operation in the total absence of sugar in any form; but this is a matter of minor importance, as the whole system of the chemical changes which lignin and similar substances undergo under the action of powerful acids is so little understood that we are, perforce, obliged to depend to a great extent upon possibilities. It is a well-known fact that lignin or cellulose, if exposed to the continued action of boiling sulphuric acid, is completely changed to grape sugar. Theoretically we can, therefore, account for the possible presence of a small quantity of that substance in the mixture of cotton and acids. We say so much in support of the idea that nitro-glucose may be formed with the pyroxyline, though it has not been found possible to prepare it direct from grape-sugar, owing, doubtless, to the fact that the latter contains two equivalents of water more than cane sugar.

Some years ago M. Camuzet startled the photographic world by a statement to the effect that pyroxyline was soluble in water to the extent of more than fifty per cent.; but after careful examination of the question little ground remained to prove the correctness of his conclusions. Amongst others Mr. George Dawson showed by

experiment that pyroxyline was virtually unacted upon by water at ordinary temperatures, though, if boiled for some minutes, the pyroxyline yielded a small proportion of a gummy substance, the nature of which was not decided.

M. Camuzet's experiments, however, only related to the solubility of the pyroxyline after it had been made into collodion, and the results he recorded were arrived at by precipitating a measured quantity of collodion by the addition of water. The difference between the weight of the precipitated cotton and the quantity which was originally contained in the collodion represented the per centage of solubility. This result, we think, cannot for one moment be relied upon. The addition of a quantity of collodion to water, or *vice versâ,* merely dilutes the mixture of ether-alcohol which holds the cotton in solution, and, in fact, *lessens* the dissolving power of the former; but it is well known that even a very much diluted mixture of ether and alcohol has a certain soluble effect upon pyroxyline, and to this we should attribute the loss in weight of the cotton rather than to any solvent power possessed by pure water.

Pyroxyline which has been kept for some time—more especially in a damp atmosphere or in the presence of free acid—undergoes a change, producing certain soluble matters which differ entirely from those formed by the action of the acids in the first instance. In such cases, however, the products of decomposition are invariably soluble in water, and have been said by some experimentalists to be similar in chemical constitution to ordinary gum. These latter products, we have no doubt, possess a certain effect of their own, but we do not imagine that the good quality of the pyroxyline depends upon them, rather the contrary.

Further than this, there is one more point we wish to touch upon, namely, the solubility to a slight extent of ordinary pyroxyline in acetic acid. What effect the treatment with acetic acid might have upon the working properties of the cotton we cannot say, but we mention it here in order to demonstrate the possibility of an unsuspected action of the acid organifier employed in Mr. Carey Lea's process.

As universally agreed, the quality of pyroxyline for photographic purposes depends almost entirely upon its reactions with silver nitrate. Pure tri-nitro-cellulose, or the explosive form of gun-cotton, possesses little, if any, organic affinity for silver salts; we can, therefore, with safety assume that it is to the by-products formed in the manufacture of high-temperature cottons that we are indebted for the success they afford us. Furthermore, several of the organic silver compounds, though quite insoluble in water, are perfectly soluble in alcohol. From this we may argue that after sensitising a plate the whole of the matter soluble in water may be removed without ill effect; but no alcoholic treatment is allowable, as that would remove the organic matter upon which depends the satisfactory nature of the image.

We will now proceed to show in what way these remarks tend to explain the difference in intensifying power between bath plates and those prepared by the ordinary emulsion processes, and why the latter, in turn, give greater density than the washed emulsions. To commence with the bath plate. The sensitive image is formed in an aqueous solution of silver nitrate. The collodionised plate is dipped into the silver solution when set, the unevaporated ether and alcohol mixing with the solution in immediate contact with the surface, and exerting a certain solvent action not only upon the film, but also upon the organic substances contained therein; but the organic matter so dissolved meets at once with the silver solution and is precipitated, before it can leave the pores of the collodion, as an insoluble silver compound.

In the case of an emulsion the organic constituents of the collodion are subjected to a much weaker solution of silver, and are, therefore, not calculated to acquire the same value as in the former case. Moreover, after coating the plate and allowing it to set, the same solvent action of the diluted ether and alcohol takes place upon the surface, but is not met, as in the former instance, by any excess of silver or other means to prevent the washing away of the valuable organic compounds. In the case of a washed emulsion the effect is very much worse, as, owing to the thickness of the layer of emulsion when ready for washing, a much larger proportion of the unevaporated solvents remain, and, consequently, the loss by solution, not only of the organic matter but of the pyroxyline itself, is infinitely greater.

Presuming that the whole of the ether is evaporated before washing the pellicle (a supposition which is scarcely probable), leaving only alcohol in the film, owing to the solubility in the latter menstruum of the organic matters, the mischief would be quite as great. To test this matter we have treated a portion of a washed emulsion film previous to exposure with dilute alcohol, the result being that the portion so treated gave an image so poor and thin as to be valueless, while the untouched portion developed to printing density with the greatest ease.

In order to try the effect of hot water we divided a quantity of pellicle previous to washing into two parts—one of which was washed in cold water until all trace of soluble salts was gone; the other was treated with successive changes of boiling water until the same result was produced. The two lots, when dried and redissolved, behaved in a very different style, that portion treated with cold water proving quite satisfactory, while the other, though working perfectly clean, refused to intensify under any treatment.

The moral we would draw from these results in preparing a washed emulsion is, first, allow the emulsion to set thoroughly before washing. To prevent the mass becoming hard and horny a good dose of glycerine should be added to the emulsion before pouring out, as recommended when the process was introduced; this will permit almost the entire elimination of the volatile solvents, and still retain the sensitive mass in a fit state for washing. In the second place, we should recommend the slower, but more certain, plan of washing in cold water rather than in hot.

In our last week's issue our valued correspondent, Mr. M. Carey Lea, renews the question of photography with clean fingers, and suggests the washed emulsion process as the easiest way out of the difficulty; but it unfortunately happens that the whole of our readers are, perhaps, not able to confine themselves to the washed or any other emulsion, and, moreover, even when working such a process, stains will occur, like accidents, in the best-regulated houses. It is also unfortunate that the stains arising from emulsions are more difficult of removal from the skin than almost any other form; hence we require a sure method of removal in case, through want of care or from any other cause, the evil in question should arise. Many and various are the plans which have been proposed for the purpose, but equally numerous are the objections which have been raised against them. For ordinary stains—that is, those arising from contact with the developing solutions—nothing is more effective than cyanide of potassium, preceded, preferably, by a touch of tincture of iodine; but the prejudice against cyanide is so great that many photographers prefer to adhere to their unsightly fingers rather than run the risk of greater discomfort. Some even object to the use of the iodine, and, perhaps, not without reason if the application be necessary as a regular thing; but if only as an occasional application it can do no harm, and the subsequent use of *hypo.* is all that is necessary for the purpose in view. Another remedy is the use of a solution of hypochlorite of lime; but objection is taken to this on account of its unpleasant smell as well as the injurious effect it has upon the skin. Beyond this the stains resulting from contact with the alkaline developer (which, by the way, is supposed, from the absence of silver, to secure immunity from stains) are much more difficult of removal than those arising from silver, and refuse to give way to the iodine and hypo. treatment. We propose to offer a cure which will, we think, be found effective in any case. A few weeks ago we recommended the use of chloride of copper for the purpose of "chlorising" the negative image previous to the application of a redeveloper, and we now suggest the same salt for the purpose of removing stains from the fingers and elsewhere, having used it successfully for some time. The mode of operation is extremely simple:—Dip the fingers in the solution (the strength is immaterial) until the dark colour is removed, when, after a rinse in water, the application of a solution of hypo. will entirely remove the stains. The solution of chloride of copper is free from any injurious

effect upon the skin, and in the case of a silver stain converts it into chloride, which is easily soluble in hypo. Its action upon a pyro. stain is not so easily explainable.

## ON LIGHTING STUDIOS.

The Editors, last week, opened up a very large question with regard to studio illumination, and, doubtless, the correspondence column will be flooded with communications on the subject, and, in the accustomed manner, with assertions as to the validity or otherwise of Mr. Vanderweyde's patent.* It is not my purpose to look at this question from the patent point of view, but rather to say *cui bono?*

But at the outset I feel rather inclined to join issue with the Editors when they speak of the subject having remained in abeyance so long. In these columns much light has been thrown upon it not only by themselves but by various writers, and, as I may refer again in the course of this article to one written by myself, and published in the number for May 13, 1870, I may now call attention to it. There is, on the other hand, no doubt but that most other technical subjects have received far greater attention than this one. Most new studios are built after the fashion of somebody else's. An operator sets up in business for himself, and makes a studio like the one he has been accustomed to work in, and so on. And, further, it may be safely said that on no subject connected with our art do so many false ideas and crude opinions prevail. If Mr. Vanderweyde's patent should have no other effect it will have done good by making photographers think on and study the special bearings of the question. To fully appreciate the effect of light striking the glass at various angles I may transfer from the article of May 13, 1870, a table by M. Bouger giving the number of rays reflected from glass at several angles, from ten to eighty-five; and the glass of a studio often being wet, the reflection from the surface of water also is given :—

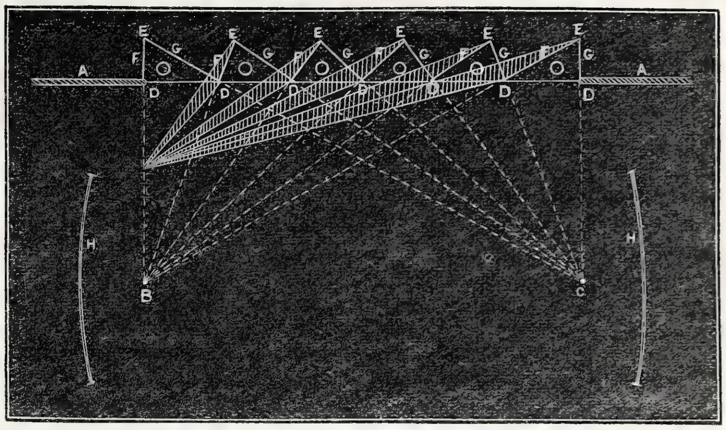
Number of Incident Rays Supposed to be 1000.

| Incidence. | Water. | Glass. | Incidence. | Water. | Glass. |
|---|---|---|---|---|---|
| 85° | 501 | 549 | 40° | 22 | 34 |
| 80° | 333 | 412 | 20° | 18 | 25 |
| 70° | 211 | 299 | 10° | 18 | 25 |

In the article alluded to the special advantage of permitting the light to fall as near as possible at a right angle with the surface of the glass is pointed out, the means suggested being the sloping front as a top light, and sides made to point inwards for side light. Mr. Vanderweyde has solved the problem in another and far more ingenious way, all the light received by the sitter striking the glass *(in one plane only)* without making any angle. But it must be borne in mind that, for the purposes of illumination, each ray of light—using the word "ray" in its commonly-understood sense—may be said to have two planes, so that the difference between the light received by the sitter, when a sheet of glass is placed directly across the path of the rays in the one case and at an angle to them in the other, is not to be measured by the difference between *total* transmission and the partial transmission due to the given angle, as calculated from the table.

Let me give an example: take the pane of glass nearest the sitter, the light striking at an angle in one plane equal to 0, while in the ordinary studio it would be a mean of about 10°—that is, a loss of light in one plane (see table) of 1·8 per cent.; but in a plane at right angles to it, the light falling on the same sheet of glass at twelve feet from the floor, upon a sitter's face six feet from the floor, would be at an angle of 45°—a loss of about four per cent.; while on the pane furthest from the sitter (say about three or four yards) by Mr. Vanderweyde's plan the light in one plane would strike at about 60°—a gain by his system of about ten per cent. over an ordinary studio window; while in the plane at right angles the angle of incidence would be only about 15°, or a loss of two and a-half per cent. It would prove a mathematical calculation of rather too abstruse a nature to be useful to work out to what extent the ten per cent. gain must be reduced to find the true gain; for it is not a simple ratio, seeing that the dimensions of the sheet of glass in the direction of the two planes have to be taken into consideration. It would be quite a fair estimate, and sufficiently near for all practical purposes, to say that at the sheet of glass furthest from the sitter the Vanderweyde studio would admit seven per cent. more light than an ordinary studio, and in that nearest the sitter about one per cent.

A reference to the diagram will show that the first two panes transmit as much light as all the others together; from which an




easy calculation will show that five per cent. is an estimate in *excess* of the true gain of light in the patent studio over the old forms. Whether such a gain is worth obtaining at the necessarily increased cost is the question for consideration. The estimate is certainly in excess, for I have not taken into account the fact that neither the nearest nor the most distant windows can be truly at right angles with the path of the light if the studio is to be reversible. There is only one shape of studio theoretically possible where no light would be lost from reflection, and that is one in which the glass roof and sides form portions of the same sphere, whose centre is the sitter himself. That such a one, in the present state of glass manufacture and architecture, is not likely to be built I need scarcely say.

It will also be seen that, as regards the roof, the new system will have to be confined to the single slope or the ridge roof, on account of the number of gutters which would be produced, which, in a sloping front roof, it would be impossible to keep clean and free from accumulations of soot and dust.

The louvre-board system of screening has had many advocates; but it has one great disadvantage which I do not remember ever having seen pointed out. It is that, unless there be power of controlling every individual board, the sitter, if placed anywhere but in his calculated place, receives less light by far than the room could otherwise allow—less the nearer he approaches the window or to either end of the room. If each board could be controlled of itself (an operation which would take an immensity of time) the sitter could receive every time he moved a few inches the full amount possible; but even then the intensity of illumination in the whole picture would diminish most rapidly to the edges, and groups could not be taken at all, owing to the inequality of the light, while with rigid, immovable boards the care that would have to be taken to place the sitter precisely in the right spot would militate most seriously against the chance of getting good pictures.

To make my meaning more clear I have added to the diagram a series of lines extending from the sitter at B to those panes of glass not used when he sits at B, and which, for the time, may be taken to represent louvre boards, as they would perform exactly the same function if, as suggested, they were covered over with blinds. The space enclosed between the lines shaded with cross lines will represent the proportion of light obstructed by the boards. The sitter is represented as being half-way between the middle of the room and the side light itself, the louvre boards pointing to the middle of the room. It will surprise many to see that more than half the whole amount of light is cut off; and, if anyone choose to go to the trouble of making a calculation or constructing a diagram, he will see that so small an obstacle as sash-bars only four inches wide placed two feet apart will, at a distance of twenty feet, with the sitter in the middle of a room twelve feet wide, stop off nearly one-fourth part of the whole light, and, with the sitter at three feet from the side, more than half the light—a circumstance which will show that there is a practical limit of usefulness to the length to which the glazing of a studio may be continued.

There is now another point to be considered which is mentioned as an advantage in the patent system, viz., that no light enters the studio or camera beyond what falls upon the sitter. That the light being prevented from entering the camera is an unmixed advantage I most

* Although we have already received several letters on the subject of the *patent*, we abstain from publishing any of them until we ascertain what *has* really been patented. It will be three or four months before we can have access to the specification.—Eds.

fully believe; but that no light should fall in the studio itself I as fully disbelieve. The advantages of the former would be most readily obtained by placing a hood to the lens. Then comes the question—What are the disadvantages? I reply: the excessive effect of contrast of light upon the face, owing to the extreme absence of what may be called "accidental reflection." There would be some difficulty in using a movable reflector under all circumstances, and, at the same time, I hold that a little reflection from the walls of the room is a great advantage in softening the shadows of the face so long as it is not allowed to be carried to excess. It is not very long ago since the Editors had some interesting remarks on the same question.

I should be the last person in the world to recommend the use of that dreadful blue colour which is affected by so many photographers in their studios; but I certainly do advocate the use of a colour that would be able to give a little light to the shadows of the figure. A short time ago I gave some very earnest thought to a consideration of this question with the view of obtaining the most suitable paper for the studio walls.

Such a paper must be the most agreeable possible to the eye in colour; this limits the choice to greens and greys. It must, further, by virtue of the preceding remarks, be able to reflect to the sitter light possessing some actinic property. This narrows the choice to a grey. The next point that arises is the pattern or no pattern. As the object should always be to allow the sitter to feel as little *ennui* as possible and to lighten the inevitable tediousness of a sitting, I think it may be fairly granted that a paper with a pattern rather than the dull uniformity of vacuity suggested by a plain dead wall should be chosen. As to the pattern itself, that is entirely a matter of taste; but it should on no account be a small diaper pattern, such as squares, circles, or diamonds of a few inches in size. Nothing that it is possible to place upon a wall is more dazzling to the eye. What is wanted is a free, flowing style that the eye can rest upon with comfort in regard to colour, the ornament being on such a scale that no fatigue is experienced in following the details of the design.

To obtain these requirements I found it necessary to have a paper made to order. I had it done in two shades of dark grey of my own choosing, and of a pattern, also, which I sent. The result pleased me excessively. Everyone who sees it likes it; it takes the sitter's fancy, is artistic in feeling, and, finally, it cost little, if any, more than an ordinary wall paper would have done. If any wish I can give them full details of cost and place where I obtained it.

G. Watmough Webster, F.C.S.

## FOREIGN NOTES AND NEWS.

M. Rodriguez's Process of Printing in Fatty Inks.—The Jacobi Process.—Details of M. Quiquerez's New Dry Process.—A French "Reclamation."

M. Rodriguez, of Lisbon, the director of the Geographical and Geodetical Works of the Kingdom of Portugal, communicated to the members of the Photographic Society of France, at their last sitting, the details of his method of printing in fatty inks, by which means he has produced the splendid proofs which he has recently exhibited. He employs exclusively bitumen of Judæa and essence of lavender dissolved in benzine. The image is developed by means of turpentine. If it be necessary to secure a reproduction in half-tone M. Rodriguez obtains a slight grain by the use of powdered sugar of milk mixed with the bitumen.

M. Carlos Relvas—another Portuguese gentlemen and distinguished amateur—also exhibited specimens produced by the phototypic process of Jacobi, of Neuendorf. M. Relvas speaks very highly of the merits of the process, of which he has become purchaser, the proofs he exhibited showing that he has made himself thoroughly master of the details. Some of the specimens had all the appearance of the choicest silver prints, while others resembled copperplate engravings.

According to the promise given in the last number of the *Moniteur* M. E. Quiquerez furnishes the details of his rapid dry process, which, he claims, combines the quality of results belonging to the albumen processes with a sensitiveness hitherto unapproached. The plates first receive a preliminary coating of albumen (one in forty) to be filtered immediately before use. M. Quiquerez insists upon the use of ammonia rather than acetic acid for preserving the albumen from decomposition, as the acid causes the growth of a species of fungus which destroys the clearness of the liquid. Any good commercial collodion may be used, but one containing a large proportion of bromide is to be preferred. The silver bath consists of—

Nitrate of silver....40 to 50 grains,
Glacial acetic acid..$2\frac{1}{2}$ to 10 minims, according to temperature,
Rain water.................. 1 ounce,

to be saturated with iodide of silver. The plate is allowed to remain in the bath at least four or five minutes, after which it is well washed, first in rain and then ordinary water, until the whole of the free silver is removed. The preservative, in which the novelty of the process lies, is made as follows:—

Solution No. 1.

| | |
|---|---|
| Roasted and finely-ground coffee | $3\frac{3}{4}$ ounces. |
| Caramel | $1\frac{1}{4}$ ,, |
| Boiling rain water | 40 ,, |

Solution No. 2.

| | |
|---|---|
| Gum arabic | 1 ounce. |
| Albumen (beaten and decanted) | 1 ,, |
| Pyrogallic acid | 120 grains. |
| Cold rain water | 26 ounces. |

When No. 1 has become cold it is filtered and added to No. 2, the whole being well agitated, when it is ready for use. M. Quiquerez attributes the great sensitiveness of this process to the large quantity of pyrogallic acid employed, the albumen, though present in very small proportion, giving great solidity to the sensitive film. The gum and caramel lessen a slight tendency to harshness noticeable with coffee and albumen alone, and also render the film more permeable during development. The pyrogallic acid facilitates the action of the alkaline developer. The preservative is applied in the usual way by pouring it on and off the plate (previously well drained) three or four times.

The development is performed in a dish, by means of a plain solution of carbonate of ammonia, the plate being plunged direct into the developer without previous washing. If the exposure have been well timed the details will be brought out without further treatment, when the film is carefully washed and intensified with pyro. and silver. If, on the contrary, the exposure have been too short the development must be continued by means of the ordinary alkaline pyro. developer. An eighty-grain solution of sulphocyanide of ammonium is recommended for fixing, as it does not destroy the half-tones. The colour of the image is a rich red-brown, but for those who prefer a black tone M. Quiquerez recommends the use of chloride of gold.

M. Alexandre, of Bordeaux, writes to the *Moniteur* to make a "reclamation." The subject of his complaint is that Mr. Warnerke has had the impropriety to write upon the subject of methylal, the use of which, though without a name, M. Alexandre had communicated to the *Moniteur* last April. Instead of being exercised in his mind at the injustice (?) done him, M. Alexandre should rather have exhibited a little gratitude towards Mr. Warnerke, who made no claim to originality in the matter, but merely to the repetition and extension of the crude experiments communicated to the *Moniteur*. A considerable fuss was made a few months ago about the advantages gained by the substitution of methylic for ethylic alcohol in the developer—advantages which were never made evident. Perhaps M. Alexandre's substitution of methylic aldehyde for the aldehyde of wine, as recommended in our columns as far back as June, last year, will be found after all to be a similar case.

## PROFESSOR PETZVAL.

Previous to the introduction of photography the formation of images by means of lenses had been limited to such as were produced by the rays which proceeded axially, or nearly so, through the lens. The transmission of large, oblique pencils was unknown; hence, on the advent of photography, and when the beauties of the Daguerreotype and wonders of the Talbotype were the theme of daily conversation in circles devoted to art and science, optical science in connection with photography was in so crude a state as to warrant its being considered practically non-existent. Spectacle glasses and object-glasses of telescopes appear to have formed the only optical resources at the command of the pioneers of our art-science. But, as the aperture of even the finest telescope objective is small in comparison with its focal length, its action was at best far from being rapid; as it was corrected in such a manner as to produce a sharply-defined image within a very limited range of its axis, a picture including more than a few degrees could not be obtained unless the aperture were still more contracted. Add to this the fact that even the finest corrected telescope objective did not produce a sharp picture on the

plane of its greatest visual sharpness, and we have then some idea of the state of our art, speaking optically. When Professor Joseph Petzval first devoted his great mathematical talents to the solution of the problem of the production of a sharp image embracing a moderately-wide angle, such image to be produced by large pencils of light and to be projected on a plane surface, these were the conditions which had to be fulfilled before photographic portraiture could be practically carried into successful operation; and when we state that, with one exception, the portrait lens, first manufactured by Voigtlander and subsequently by every maker in the world, owes its inception to Petzval, we need say no more concerning the ability with which he accomplished his self-imposed task.

Professor Petzval is, we are happy to say, still alive. He is a native of Hungary, and has been in Vienna for many years. He was, we believe, a student at the time he began his work upon optics, and continued his labours when filling the mathematical chair in the University of Vienna.

PROFESSOR PETZVAL.

From what has been said it will be seen that the well-known Voigtlander portrait lens is, in reality, the Petzval lens. The history of the union once existing between Petzval and Voigtlander appears, as we learn from such documents as are accessible to us, to have been as follows:—

About a year after Daguerre's discovery, Herr Voigtlander, when calling upon Professor von Ettingshausen, was asked by that gentleman whether he could determine the refracting and dispersing power of different descriptions of flint and crown glass, because Professor Petzval had made the calculation of the photographic lens, which could not be executed in consequence of the qualities of the glass to be employed not being then in existence. Voigtlander, intimating his ability to do this, was asked to call immediately on Petzval, being handed a letter of introduction to that gentleman, accompanied by the observation that by furnishing the means to execute this lens he would render great service to the world and secure to himself high reputation. The letter of introduction was duly presented, and thus was originated an intimacy which continued for a considerable period. The result of the first interview was that Voigtlander furnished the desired information respecting the qualities of the various glasses which formed the foundation of the calculation of two combinations of lenses executed by Voigtlander, one of these being the well-known portrait combination, the other the orthoscopic lens, which was not introduced to public notice till 1857. Some time previous to the latter date a separation had taken place between Petzval and Voigtlander; and when Dietzler, who was previously in the employment of Voigtlander, brought out a "new" lens constructed under Petzval's supervision the great Brunswick optician immediately issued the "orthoscopic," the formula for which he claimed to have received from Petzval at the same time as that of the portrait combination. There ensued a correspondence of a piquant, if not acrimonious, character, which, however, we cannot honestly regret, inasmuch as it proved the means of affording much information concerning the inception and manufacture of the Petzval lenses—information of which, but for the recriminatory controversy indulged in by these *savants*, we should probably have remained in ignorance. The portrait lens was first issued about 1841, the orthoscopic having been kept in abeyance till 1857. Such, after wading through voluminous correspondence, is the short and simple history we are able to glean regarding the introduction of an instrument which, more than anything else, has influenced the march of photographic science.

The orthoscopic lens was extensively manufactured by other opticians, who introduced certain alterations of a mechanical nature into its construction and issued it under other names, which, if mentioned here, might be considered invidious. As a proof of the *very* slight modifications subsequently made we may state that we possess a 12 × 15 Voigtlander orthoscopic lens, and also one of a similar form but bearing a different name by another maker of eminence, and the back pair of one can interchange with the other without sensibly affecting the focus of either combination. In order to realise the similarity of the copy to the original it is necessary we should state that the back lens, being negative, exercises a powerful influence upon the focus of the combination, a very slight alteration in the power affecting greatly that of the completed objective. Notwithstanding the name, this lens did not give freedom from distortion, and it eventually gave way on the introduction of other and better forms from which distortion was entirely eliminated.

The optical inventions of Professor Petzval have not been confined exclusively to photography. It is probable that few of our readers are aware that the opera glass, field glass, race glass, or by whatever name the familiar binocular is known, also originated with the talented subject of our present sketch. To combine power, distinctness of vision, and compactness in a binocular had long been a desideratum. The reconstruction of the lenses of this instrument was undertaken by Petzval, and with what success our well-known "twelve-lens" opera glasses bear witness. By achromatising the eyepieces, each of which is now formed of a cemented triplet, a much greater degree of concavity was obtained than previously; while by adding a third element to the glasses of which the front lens, or objective, is composed, all the qualities above enumerated have been secured.

A few evenings since, when watching the ascent of a magnesium balloon at the Alexandra Palace, we were very forcibly reminded of something that has been said by Professor Petzval. "It is not at all improbable," he said, "that the time will come when in every capital of Europe, and even perhaps in smaller towns, there will be erected a building of a dome shape and immense height, crowned with a transparent pavilion containing a gigantic flame which would send to all the neighbourhood a much richer and more equal light than our present system of illuminating by an immense number of small points of light. One good result of this kind would give rise to many more imposing ones, and would end in its general adoption." On the occasion referred to the Queen of Night was at the full and shining in all her refulgence, while in the same direction, at the distance of three-quarters of a mile, the magnesium balloon was slowly sailing through the air. The superior intensity of the magnesium light was apparent; for, when tested by a hastily-extemporised photometer, the light emanating from our fair satellite was dim in comparison. If Messrs. White and Larkin keep their promise and supply magnesium at "a shilling an ounce, or even less" (we here quote words used by Mr. White to us), then may we hope to see in a fair way of being realised the idea of Professor Petzval.

We have seen that photography, up to within a comparatively recent period, owes to Petzval *everything* that made the art possible. It involved genius of the highest order to devise the methods to grapple the problems to be solved, and an endurance which may be gauged when we state the fact that some dozen computers selected from the Corps of Military Engineers were engaged for months to make the necessary computations after the completion of his formulæ.

It is greatly to be regretted that neither the methods employed nor the results of these investigations in a tabular form have up to the present being given to the world. It is to be hoped, however, in the interests of science, as well as that of our art, that a work of such magnitude and transcendent ability will not be lost, and that the Royal Academy of Vienna will be induced to undertake

the printing and publication, as it has already done the important work of *Linear Differential Equations* by the same author.

Our portrait of the talented mathematician is reproduced from one in the possession of a friend.

## NOTES FROM THE NORTH.

Everybody is at present either out after the grouse or in pursuit of the more peaceful and, I think, more intellectual pursuit of landscape photography, so that it is more than usually difficult to get together an interesting and useful batch of *Notes*. Here follow a few, which must be taken for what they are worth, on the understanding, or, perhaps, I had better say in the expectation, that the results of the many August "outings" will be richer in such matter, and that next month I shall have a more interesting story to tell.

Of course when I say "everybody" is off holiday-making I do not wish the word to be taken in its literal sense, as there really are a few who feel bound to stick to work, and to them—good, obliging souls—I am indebted for the few odds and ends that have been picked up.

The use of methylal as an accelerator has been attracting some little attention, and its fame has found its way here. From some experiments I have just seen made by one of our most successful operators I am in a position to say that no more has been claimed for it than it deserves. There is, however, not the slightest necessity for bothering the experimental chemist with its somewhat troublesome manufacture, as there is on the shelves of every chemist in the country a substance that answers the purpose in every respect as well. I mean the sweet spirit of nitre—the *spiritus ætheris nitrici* of the Pharmacopœia. This may be procured anywhere at from fourpence to sixpence an ounce, and if made with methylated spirit at half that sum. A developer composed of fifteen grains of protosulphate of iron, two drops of formic acid, and ten drops of the sweet spirit of nitre will give a beautifully clean negative in little more than half the ordinary time, or, rather, with little more than half the exposure required by the ordinary solution containing the usual quantity of acetic acid and alcohol. Now, if my readers have in future any difficulties in photographing babies, the fault will lie with themselves and their conservative notions; as I have seen the thing demonstrated and have repeated the experiments myself, I am perfectly satisfied that it is true.

Does anyone want to develope with clean fingers, and object to the stained corner so frequently produced when the plate is held by the finger and thumb? If so, here is the remedy:—Buy a penny jug with a handle. Take hold of the handle, and lay the plate across either the bottom or mouth, and go ahead with the development. Probably the plate will have a tendency to slip off the jug, but this is easily prevented by putting on two thin rubber bands across the mouth and bottom. This little dodge I saw in use at the establishment of Messrs. Ross and Pringle, and thought it too good to be neglected. Probably the idea is not new, but it was so to me, and may be to some of my readers.

I have often written strongly against the habit of retouching, but now wish to say that my objection is slightly modified since the introduction of the beautifully transparent retouching paper, for which, I think, we are indebted to Germany, or to a German house. One great objection to the habit was the fact that in too many cases the likeness was altogether lost, and in cases where *post mortem* pictures were required, or where a print was used to enable an artist to paint a portrait of one deceased, such a touched-up negative was simply misleading. Now, however, the touching may be done on the paper to any extent that the whim or vanity of the sitter may demand, while the negative retains all its native beauty; and, whenever a true likeness rather than a fancy picture is required, it can be produced by simply removing the retouched paper.

I presume that blisters still occasionally bother printers, and so record for their benefit the latest cure that I have come across. It is this:—Whenever a sample of paper gives indication of a blistering tendency float it, face up, on spirit of wine—before sensitising, of course. The methylated article will do as well as the pure, and is, of course, much cheaper. This, at least, is the course adopted by an artist on whom I recently called, and he assures me that it is "a perfect cure."

A photographer should be a "jack of all trades," but especially should he be a bit of a mechanic. The advantage of a little mechanical ingenuity was very clearly demonstrated to me a few days ago. A friend was required to copy a picture, and it was necessary that the negative should be precisely twenty-seven inches in length, while his camera was exactly that size, inside measurement, and the slide only twenty-three inches. On being remonstrated with for undertaking a commission which he had not the tools to execute, he quietly remarked that it was astonishing what could be done with a few feet of half-inch deal board and some nails when one knew how to use them; and such, in the course of the day, turned out to be the case. He set to work and constructed a rough but thoroughly useful slide that went *outside* instead of inside the camera as usual, and so was enabled to use a plate the full size required. Just as he was about to commence the copying another difficulty occurred—the only available place for the camera was found to be too low and too narrow to admit of the slide being drawn up or out. "Cut a hole in the ceiling," said one; "break through the partition," said another; while a third thought he had hit the right nail on the head by advising the shutter to be made by glueing laths on cloth and making it to roll. This was evidently the most feasible plan; but as it would take some hours to dry, and my friend had only minutes in which to complete the work, that plan could not be adopted. The knot was at once cut by running a saw through the middle of the shutter and putting on a pair of hinges, so that it could be folded down when half out. In this way, at a very trifling cost and in a very short space of time, the ingenious photographer was able to make a copy of a size that in nine cases out of ten, under similar circumstances, would have been declined on the ground of being larger than the apparatus at command could take.

I am sorry that Edinburgh has done so little for the Rejlander memorial fund, but am glad that his picture of the Prince Consort, which was raffled for a pretty large sum, has fallen to Mr. Ross, who has always been one of his most enthusiastic admirers. I understand that if anybody were disposed to offer Mr. Ross anything like a fair price for the picture he would be willing to sell the work and hand the amount realised to the trustees of the fund. I am also glad to learn that another admirer here has paid ten guineas for Rejlander's portrait of the *Archbishop of Canterbury;* so that, after all, although the general photographic public have done little, Edinburgh has done something to help forward the good work.

In a former budget of *Notes* I tried to point out the folly of using thin transparent colour in painting photographs in oil; now I wish to say that I have just seen a plan practised which, I think, is worthy of imitation. It is to paint roughly, but plentifully, on the back of the canvas (which should be of the thinner sort) with colour similar to that used on the front. This, in the opinion of the artist whom I saw doing it, would tend to strengthen and keep out the work, and produce altogether a better result. He, at the same time, showed me some paintings which had been executed on a photographic basis, and which, evidently, had not been properly fixed. The result was that all the lighter colours were darkened to such an extent that the work had to be redone. This, of course, shows the necessity for the perfect removal of the chloride of silver from canvas intended to be painted in oil.

On the same occasion I saw a very fine effect—the result of a combination of water-colour and oils. The subject consisted of a foreground of water, with some rocks, trees, and hills in the distance. Standing in a boat were two well-posed female figures. The whole picture except the figures was painted in oil; but as the latter were too small to be effective in that medium they were done in water, and the effect was very charming. For the encouragement of those who are up to this kind of work I may say that the painting, which measured 18 × 15, was on an enlargement from a recently-taken *carte* negative, and was done as a speculation; but it had not been many hours in the reception room when a duplicate was ordered for which the sum of fifteen guineas was agreed to be paid.

John Nicol, Ph.D.

## Our Editorial Table.

Views in America. By J. Jex Bardwell, Detroit, Michigan, U.S.

What a scene of desolation is presented by the ruins of Chicago! No engraving or drawing could tell the tale of the destruction by fire of that great city with half the eloquence of a series of stereoscopic views of *Chicago Ruins After the Great Fire, October*, 1871. Stereoscopic photography possesses exceptional value as regards the great

penetrative power it confers upon the spectator, who can separate the various planes and distances in a manner which could not be effected by monocular photography even of the highest degree of excellence. In these views of Chicago Mr. Bardwell has shown much artistic skill in the selection of the most effective points of view, while their technical merits are also very great. Accompanying these valuable mementoes of a sad passage in the history of one of the fairest and most enterprising cities in the United States are also a few photographic *Sketches In and About the City of Detroit.* These, as well as the Chicago views, are from negatives prepared by the coffee process, and they attest the proficiency that Mr. Bardwell has attained in this method of preparing dry plates.

AN EASY INTRODUCTION TO CHEMISTRY.
London and Oxford: RIVINGTONS.

WE have repeatedly urged the importance of all young aspirants to photographic fame acquiring not merely a knowledge of the chemistry of the art-science of photography, but a wide and comprehensive acquaintance with chemistry in general. This *Easy Introduction to Chemistry* is an admirable little volume to put into the hands of anyone desirous of possessing a popular, yet useful, knowledge of the science of which it treats. It is written in a pleasant "taking" style, and is copiously illustrated. The various subjects introduced are treated in twenty-six chapters, with extracts from two of which—chap xi., on *Iodine and Bromine*, and chap. xxiii., on *Wood and Cellulose*—it was our intention to have presented the reader as specimens of the work, but which, owing to pressure on our columns at present, we must defer till another opportunity.

The work is edited by the Rev. Arthur Rigg, M.A., and Walter T. Goolden, B.A.

STUDIES. By FRANK MILES.
London: W. A. MANSELL and Co.

LOVERS of true art are indebted to Messrs. Mansell and Co. for issuing in such a neat form (a portfolio, cabinet size) the artistic gems of Mr. Miles. Unlike the last pictures submitted to our notice by Messrs. Mansell these are not photographs from nature but from drawings. The first thing that strikes a photographic observer is the delicate beauty of the process by which these "studies" have been printed; for, while they are on plain paper, they possess the vigour of albumenised prints, and yet it is difficult to imagine that such tones could be obtained from silver. Without possessing any information on the subject we conclude that the printing must have been effected by either Willis's platinum printing process or by some method analagous to it, the tones being so like those obtained by Mr. Willis. If we are correct, to the charm of beauty inherent in these lovely specimens of art must be added the further merit of permanence.

# Meetings of Societies.

## WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.

THE ordinary monthly meeting of the above Society was held on Monday, the 2nd instant, at the Victoria Hotel, Bradford,—the President, Mr. J. W. Gough, occupying the chair.

The minutes of the last meeting having been read and confirmed, Mr. Berry, of Gomersal, was elected a member.

The Secretary laid on the table five numbers of the *Journal de Photographie* which had been forwarded for the Society's use. He was instructed to post in return THE BRITISH JOURNAL OF PHOTOGRAPHY monthly in acknowledgment of the compliment.

The conversation then turned on the discussion of the validity of the Lambertype patent which was being carried on through the medium of the journals.

Mr. W. E. BATHO, in alluding to M. Lambert's reply to his paper read at the last meeting of the Society, read the following quotations from the law regarding patents:—"Occasionally a patent is taken out jointly in the names of two or more persons, but if it be found that one or more of such persons had no part in the discovery the patent is void." "The invention must be new—not previously used by the inventor or others." "The specification is null if any part claimed be not original."

After several remarks by Messrs. Mori, Wormald, and others the subject was dropped.

Mr. WORMALD inquired if any member could tell him the best method of mounting autotype prints. He had had a large number to mount, and had met with much difficulty in inducing them to lie flat.

Mr. BATHO remarked that when wetted the two films of gelatine and paper would curl, and then begin to curl the opposite way. The time to mount them was when both films were equally expanded.

Mr. WORMALD said the manner in which he had overcome the difficulty was by placing both print and mounting boards between folds of wet blotting-paper.

Mr. SACHS inquired if anyone had noticed any symptoms of fading in autotype prints. He had had a large autotype on drawing-paper for about six months, part of which time it had been exposed in his window, and it displayed unmistakable signs of deterioration.

Mr. CROSTHWAITE remarked that the deterioration in colour of drawing-paper was a well-known and acknowledged fact. He himself, only a short time before, had occasion to remove a water-colour drawing from a frame where it had hung for some months, and found that where it had been exposed to light it had turned to a yellow tint, but under the mount it retained its original whiteness. He thought it possible that the paper on which Mr. Sachs' picture was transferred had turned slightly yellow and thus reduced the apparent brilliancy of the picture, though there might be no real deterioration in the blacks of the picture.

Mr. SACHS was of opinion that the blacks were decidedly reduced and some of the half-tones gone.

Mr. BATHO said permanency was entirely a relative term; nothing was really permanent. He was of opinion that an autotype picture was as permanent as an engraving, and most certainly much more so than a silver print. The paper, it was certain, would not keep permanently white; but, seeing that the picture consisted of a permanent pigment, bound up in insoluble gelatine, he thought the process was really as good as anything they could expect.

Mr. SACHS said he had in his possession a silver print some fifteen years' old which was now as good in colour as when it was printed, and he thought that, with proper treatment, a silver print might be made as permanent as a carbon picture.

Mr. GREAVES said it was probable that one of the causes of the present fading of prints was to be found in the inferior quality of the albumenised paper now in use. It was nothing like the paper in the market some ten years ago. There seemed to be a general falling off in quality.

Mr. BATHO remarked it was often said that paper prepared with blood albumen was much more liable to fade than when prepared with egg albumen.

Mr. CLARK kindly volunteered to exhibit and explain the difference in the constitution and qualities of the two albumens at the next meeting.

After some further conversation the Secretaries were instructed to obtain a portfolio for contributions for the members' use, and an album to which all the members might contribute their portraits.

The meeting was then adjourned.

# Correspondence.

THE CONGRESS AT NANTES FOR THE ADVANCEMENT OF SCIENCE.—ENAMEL AND PHOTOGRAPHIC VIEWS ON CHINAWARE, &C.—*L'EVENEMENT* ON M. LEON VIDAL'S INVENTION.

"SUIVONS LA MODE" appears to be the general cry of amateurs and photographers at the present moment. The Photographic Society of France has closed its doors until next November; its members are, as it were, flying from Paris towards the sea, or preparing to make a "massacre of the innocents" as soon as the law permits them at the opening of the shooting season. Happily there are some champions of science still at their post. The Association for the Advancement of Science is in congress in the town of Nantes. This Society merits to be known, and its example to be followed by every civilised people. "With all our learning we know very little," said the great Arago. With this idea in view several gentlemen founded an Association for the Advancement of Science. Every year takes place a meeting which is called a "congress"—sometimes in one town, sometimes in another. The first was held in Bordeaux, the second at Lyons, the third at Lille, the fourth (this year) at Nantes.

At this congress any man throughout the whole French territory can submit the results of his study in a communication, which is printed in the *compte rendu* of the congress. The result is this—that any humble professor, any modest agriculturist, any intelligent workman who could not save sufficient money to have his ideas made known, can now have his discoveries published in the volumes of the Society, read and commented upon by thousands, and, what is more, brought to the knowledge of men able to appreciate and reward merit.

It would require more space than I can command to state all the advantages which France and even the world have reaped from this Society. For instance: last January a poor cultivator of the soil (M. Telliez) presented to them a system of cultivation by which new potatoes could be obtained in the middle of winter! The Society encouraged him and success has crowned his efforts. It is now certain that we can have new potatoes all the year round. What a boon to the

lovers of that esculent! What riches will this "invention" bring to France! What an honoured name will this man hold for posterity—for the name of Telliez will now be mentioned in connection with that of Parmentier and Sir Walter Raleigh! A report has been made to the Institut which states that this system of cultivation of the potato is excellent, and that experiments were to be carried on simultaneously at the Jardin de Plantes, the Jardin du Luxembourg, and the Jardin Zoologique d'Acclimation. M. Chatin, member of the Institut, proposes to cultivate immediately the departments lately destroyed by the inundations; a crop of new potatoes could then be had in January. Great service will thus be rendered to a district which has been stricken by a fearful calamity—thanks to a few gentlemen filled with patriotism and a love for learning. Let us wish them success this year.

The Congress held its first meeting on the 19th inst., and M. Eichtall, the President, in a *résumé,* gave a history of such important services rendered to mankind by science that one must be either very headstrong or too modest to say now, with Arago, "we know very little." M. Eichtall concluded by saying that "Jupiter was no longer master of his thunder, for science had taught men to vanquish the thunderbolt of the mythological god, and to compel it to obey and even to fly several times round the earth in a minute, carrying news from one extremity to the other more rapidly than ever dreamt of by Mercury." When all these marvels are before our eyes it may be permitted to say that science is the most powerful sovereign of modern times. Let us, therefore, welcome its votaries and friends. The Mayor of Nantes understood the value of this and bade a hearty welcome to the Congress of 1875.

"How beautiful!" is the exclamation of the public in general when an enamel is presented to them. "How fine in the shadows!" "How sharp in its outlines!" "How lifelike and charming!" "How precious, as it is unchangable!" Such are some of the familiar exclamations which are always to be heard during an examination, I may say, of the masterpiece of photographic art. But here stops too frequently public enthusiasm. Why is it so? Is it indifference? Is it because it is too expensive? Is it because a dozen or more can be obtained for the price of one? or is it from ignorance? The fact is many photographers do not think it worth their while to undertake the production of enamels, and of those who have devoted themselves to that branch few, if any, have succeeded in realising a fortune. Therefore, it is to be surmised that the fault lies with the public; for if a great demand existed no serious photographer would consider himself "in the movement" without having his furnace, &c., in working order. Is it ignorance in the public? If so, a little tact in the photographer could easily overcome this, as Nature herself could be called to his aid, and would in this case be a powerful advocate. Our poor nature has such an inherent fear of oblivion that the greatest as well as the smallest actions of men can be traced to it. The great ambition of the warrior is that his actions may be recorded in history. The great and powerful desire that their names may be handed down to posterity. Even the good and virtuous are solicitous to be heard of hereafter. The rich build mansions and interweave their monograms in architectural designs. Even the lower classes scribble or engrave their names upon public monuments with the hope (unexpressed but felt) that their names will be read when they are no more. So each in his social order, from the sovereign to the menial, has an undefined desire of being known and not wholly forgotten after having passed away from this transitory scene.

What, then, could be better than photographic enamels to perpetuate in families the *souvenir* of the members from one generation to another? Is it because they are too expensive that the demand is so inconsiderable? This is perhaps so; but as soon as the refined taste of the public perceives by the restricted supply that enamel photography is appreciated and well paid for the price will naturally fall, for then every photographer will set to work to produce a better and a cheaper article.

A large manufactory is about to be opened in Paris for the production of enamels, but, above all of landscape photography on porcelain, chinaware, earthenware, &c. Instead of the rough designs on our plates, tea-services, &c., this company proposes to supply us with artistic views in colour—at once pleasing to the eye and instructive to a contemplative mind—at a very cheap rate. A novel idea has also sprung out of this, which is to prepare an enamel and imbed it in a tombstone, to show the portrait of the person who sleeps beneath. If this secure public favour our graveyards and cemeteries will become a book giving the portraits of those who "sleep the sleep of death." This would at once charm and awe visitors by showing them that the grim hand of death has been laid as heavily upon beauty and youth as upon old age and decrepitude. "*Memento mori*" would be engraved deeper into the minds of visitors by contemplating such portraits than by reading those vainglorious praises to be seen engraved upon tombstones in our churchyards.

How to make such portraits in a cheap practical way has been solved. Everyone can remember the mania which raged among children called "*décalcomanie,*" by which they were enabled to decorate wax tapers, bottles, cups, glasses, &c., by attaching a printed image to the object and then detaching the transfer paper, leaving the painted design upon the vase. Alas! this image was very unstable—the least damp made it peel of; in fact, it was only a plaything. This idea, which was encouraged to give pleasure to children and tranquility to parents, gave birth to another, which is that, instead of painting the objects for *décalcomanie* in perishable colours, it was well to do so in metallic oxides, so that when transferred to chinaware, enamel, &c., the object could be submitted to the action of fire and thus rendered permanent. This was tried and found to succeed. It can now be seen with what rapidity these proofs can be produced; this will cause them to be cheap and naturally popular. This idea shows once more that great inventions have often a very simple origin.

I read the following the other day in one of the Paris daily papers *(L'Evénement)* which will prove that the idea of M. Leon Vidal is now in right hands, and its success only a question of time:—

"When a fact such as the one of which we are going to speak is brought forward it is necessary to call public attention to its conseqnences, and applaud those who have had the courage to make great progress in science. The following took place:—A short time ago M. Paul Dallaz, *directeur du Moniteur Universal,* received the visit of an inventor, M. Vidal, who has discovered an admirable process, which is no other than the colouration of photographic prints without the aid of a brush. We have inspected two marvellous pictures. One could swear that the work of the painter itself was there as it was to be seen when it left the easel of the artist, everything is rendered with such art and exquisite faithfulness. The softest colours, the smallest details, even the warp of the canvas, may be found. We remained in admiration before these palpable proofs; so perfect are they that it must be known to be believed that it is not the true canvas which is before us, but a reproduction on paper. Our readers can understand in a moment what is the advantage of this invention in a scientific point of view. M. Vidal has found what many laborious persons vainly sought before him. M. Dallaz has the intention of reproducing the best pictures of French art, more especially those of the Louvre and Luxembourg. All those *chefs d'œuvre* will thus be popularised and sent out by thousands all over France. The smallest hamlet can then possess a reproduction of a *sainte famille* by Raphael—a more lifelike reproduction and truer than a painted copy, in which many faults could be found. All will gain by this discovery—French art as well as French science. It is long since we first said, 'The revenge of intelligence is the true revenge.'"

We all wish great success to our friend Vidal; the quicker he can improve our tastes for the fine arts the better it will be.

E. Stebbing, *Prof.*

3, *Place Bréda, Paris, August* 23, 1875.

## WASHED EMULSION.

*To the* Editors.

Gentlemen,—Inspired by the various articles which have lately appeared in the Journal I have been experimenting somewhat extensively in the preparation of collodio-bromide pellicle.

I have confined my attention to the simpler forms, excluding chlorides, iodides, or acids, to take up excess of silver, and have always used bromide in excess, believing that greater certainty results from this method in the production of clear films. My success has been most apparent in a quantity prepared by the application of a bath of *tea* to the partially-washed pellicle, giving afterwards several more washings. The discolouration of this batch is not much, and the redissolved emulsion works clear and dense and moderately quick.

It is only in my last trial with some made on the principle of the concise particulars given in the first article of your issue of the 30th July that any startling appearance has occurred. On adding the alcoholic solution of tannin to the *raw* emulsion it almost immediately assumed a pronounced slaty tint, which does not look nice. Should this be so?

I have poured it out to evaporate, and this morning covered it with water, which in a few minutes became charged with a dark brown deposit. This is easily removed; and I will continue the washing with the hope of getting it into working condition.—I am, yours, &c.,

2, *Upper Tollington Park, N.,* John Nesbit.
*August* 24, 1875.

[Our correspondent has either omitted altogether the use of acid or has employed it in too small quantity. In the second paragraph of the above letter Mr. Nesbit appears to state the former to be the

case. It should, however, be borne in mind that free silver, in connection with a reducing agent such as tannin, should on no account occur in an emulsion except in the presence of acid. The latter not only retards or altogether prevents the reduction of the silver, but renders any slight discolouration which may occur easily removable by washing. In the case of an *excess* of silver the water should be acidified until the silver is all removed. It is also well to remember that free or uncombined silver may exist in an emulsion which really contains bromide in excess, and such an emulsion would rapidly discolour upon the addition of tannin without acid. It is, indeed, scarcely safe to treat any form of emulsion in that manner.—Eds.]

## THE LAMBERTYPE PATENT.

*To the* Editors.

Gentlemen,—As, at the end of my last letter, you have been kind enough to state that, having been the first attacked, I am entitled to the final reply, allow me to answer last week's letters as briefly as possible.

Mr. Brothers commences his letter by saying—"I deny that Mr. Lambert has the right to patent the use of semi-translucid paper on both sides of a negative." I must, in reply, again reiterate that I have made no such a claim in my patent, the point in my invention being the *retouching* on both sides of a negative thus covered with paper.

Mr. Brothers says—"As Mr. Croughton *threatens* to use this method, let M. Lambert bring an action against him." Has Mr. Brothers yet to learn that an action cannot be brought against any person merely because he "threatens" to infringe a patent? When the proper time arrives, and infringement can be proved, it will be found that I am both able to protect my own patents and also prepared and ready to protect my licensees against all illegal competition by infringers. But I fear that I shall in vain court an investigation of the validity of my patent in a court of law, and for this reason—that the retouching as claimed by me will produce but doubtful results unless it be produced upon a special mineral paper, and be used in conjunction with a special tissue and other materials supplied to none but licensees.

Mr. Brothers says that it is difficult to see any connection between the matter of the Lambertype and the question as to whether he (Mr. Brothers) ever bought exclusive agencies of any secret processes. This gentleman seems to forget that his first letter was more an attack on *process-mongers* than on my patent, and I wished to know if he possessed all the necessary qualifications to moralise on vendors of secret or patent processes, and if some little petty trade jealousy might not lie at the bottom of his attack. He says (page 382), "I have never advertised or offered for sale any secret process or dodge." I learn however, through Mr. Winstanley, of Blackpool, that he (Mr. Brothers) was advertised as sole agent for a certain district for Sarony's method of enlarging, my correspondent having purchased from him that method on December 12, 1872; and, further, that he was also, and is still, agent for the Ferranti-Turner method of finishing enlargements. The antagonistic feeling displayed by Mr. Brothers towards a rival process to those in which he has been commercially interested will now be quite well understood.

Concerning another matter alluded to by Mr. Brothers: if this gentleman desires to have any discussion with Mr. Lambert-Sarony, who, it seems, sold the same process as the one sold by Mr. Brothers, and also the Vanderweyde process, like Mr. Croughton, let him address himself directly to that gentleman, as I have enough to do to mind my own business. A man must be surely short of argument when he feels reduced to make insinuations against Mr. Lambert-Sarony of England (who is no relation of mine), as a fit revenge on Claude Leon Lambert, of France, for his not allowing his character to be handled by a jealous competitor. Having as good, and certainly as widely-known, a name and a reputation for honour as Mr. Brothers, of Manchester, I shall not allow him to use such insinuations against me, "as he might prevent exposures," &c. I dare him to make any exposures, and treat with contempt such insinuations.

Mr. Samuel Fry, of Surbiton, makes a mistake when he says Mr. Colton is in my employ; but I presume this erroneous statement is made to try to weaken that gentleman's assertion. He makes another erroneous statement when he says that, at Mr. Jabez Hughes's suggestion, I intended to write by that night's post to invite him to Greenwich. Why should I invite Mr. Samuel Fry in preference to any other photographer? If I attached the most microscopic importance to his opinion on my process could I not refer the readers to the *News* of December 11, 1874, page 599, where they would see the following under the heading of *M. Lambert's Mode of Finishing Negatives*:— "Mr. Samuel Fry informs us that he has tried the mode of finishing negatives described in our article on the Lambertype, October 23, 1874, and finds it admirable in results and very easy of application."

Amongst the many leading photographers who have come to express to me their disgust at the unfair way my process has been attacked and misrepresented, I am authorised to name Mr. Fred. Southwell, of Southwell Brothers, Baker-street, London, who says that as Mr. Croughton learned his method of putting two papers on a negative when in his employ, he had called on me simply for curiosity's sake, and, now that he had seen the Lambertype process, he was convinced that not one of the gentlemen who spoke against it can even understand what really is that process, as he, for his part, must admit he never saw anything even approaching it, and concluded at once to buy a license.*

In what I have said I have simply defended myself against interested attacks, and I hope I have succeeded in showing the motives of those who made them. That of Mr. Samuel Fry must now be apparent to all. As for the three others, Mr. Croughton sold the Vanderweyde process; Mr. Brothers sold the Sarony, and was agent and, according to Mr. Winstanley, is still agent, of the Ferranti-Turner process for Manchester; while Mr. Batho was agent for one of Mr. Winstanley's secret processes.

Thanking you, gentlemen, for the fair chance you have given me to understand that in England the press will give, even to a stranger, fair play,—I am, yours, &c., Claude Leon Lambert.

*Greenwich, August* 24, 1875.

P.S.—I sign my name in full this time, contrary to my usual habit, as I am aware that Mr. Samuel Fry is forwarding letters saying I did not write the two last letters signed "Lambert." A friend of mine received such a letter from Mr. Fry, and sent me a *résumé* of it. Let me say that the two letters signed "Lambert," as well as this one, were dictated by me to my interpreter. I have no agent in England, and am the only one responsible for their contents.—C. L. L.

[With the publication of the foregoing letter, from which we have excised a large portion, and some remarks in a leading article, the discussion on the Lambertype patent here absolutely closes.—Eds.]

# Miscellanea.

An Old Proverb Newly Applied.—A sporting friend has lately had a favourite racer photographed, and wishing to show the animal its likeness he put the *carte* before the horse.—*Punch.*

Curious Case: Photographs in the New Cut.—On Monday last Morris Goldbergs, Maurice Cohen, and Abraham Cohen, all of Middlesex-street, were placed at the bar, before Mr. Benson, at the Southwark Police Court, charged with exposing a number of indecent photographs for sale in the Lower-marsh, Lambeth. Richard Parkes, a detective officer of the L division, said that on Saturday evening he was on duty in the Lower-marsh, Lambeth, when he saw the prisoners in charge of a costermonger's barrow, on which were exposed several hundreds of photographs for sale, among which were a number of an indecent description. There were a great many people buying them, and when he went up to the barrow Goldbergs placed several of the photographs in his hand. On examining them he found them to be very indecent. In consequence of that he took the prisoners into custody, and seized all the photographs. Witness here handed a portmanteau full of them for his worship's inspection. Many of them were likenesses of celebrated females. Mr. Benson hinted that they were not in a state of nudity. Mr. Chipperfield, who appeared for the prisoners, informed his worship that they were copies of works of art, and not from portraits. Some of these, his worship would see, were photographs of statues, but could not be reckoned to be indecent. They were openly sold at many of the fashionable shops at the West-end. Mr. Benson, after examining them, observed that he should have a bad opinion of any shopkeeper selling such photographs. Some of them, he perceived, related to works of a celebrated French artist; but being copied and exposed for sale in the street became indecent. Mr. Chipperfield said the prisoner did not sell them to young people. These things were sold openly in France. Mr. Benson considered that very likely, as they were not so particular in France. His opinion was, however, that exposing and selling such things in the streets of the metropolis was improper, and came within the operation of the Police Act. The prisoner Goldbergs here stated that his worship's opinion was in direct opposition to that of Mr. Bushby, the magistrate at Worship-street. Mr. Benson asked how that happened. Goldbergs stated that about four weeks ago he purchased a large quantity of these photographs, and, before selling them or exposing them for sale, he instructed Mr. Vann, a solicitor, and they both applied to Mr. Bushby to know whether these photographs were indecent. Mr. Bushby examined them, and said they were not indecent, as they were copies of works of art. Mr. Benson expressed his surprise that such should have been the case. He did not think Mr. Bushby examined those now before him. However, his opinion was that they were indecent. Mr. Chipperfield asked for a remand, to enable him to communicate with Mr. Bushby. Mr. Benson did not object to a remand, but at the same time nothing would alter his opinion. It might, therefore, be a case for the court above. He allowed the prisoners to enter into recognisance to appear on a future day.

* Among the numerous letters we have received relating to this matter is one from Mr. Southwell, in which he strongly affirms all that is here alluded to by M. Lambert.—Eds.

## EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale,* that being done at the small cost of one shilling in our advertising pages. This column is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

Wanted to exchange, a gross of one-sixth size cases for crystallised nitrate of silver or Mawson's negative collodion.—Address, NIL DESPERANDUM, Sunderland.

Wanted, a good view and group lens, for plates $6 \times 6\frac{1}{2}$, in exchange for an excellent *carte* lens, with rack movement, by Ross; also a sliding-body camera.—Address, A. M. S., 3, King-street, Kensington, W.

A Thomas's patent box, with fittings complete, for plate $8\frac{1}{2} \times 6\frac{1}{2}$, is offered in exchange for sciopticon and slides or scientific photographic apparatus.—Address, W. T. WILKINSON, 18, Kirchen-road, Ealing Dean, W.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

FREDERICK SOUTHWELL.—Received.

V.—Tannin, if pure, is quite soluble in water.

CHARLES WALDACK.—See reply to "C. G. Collins."

C. G. COLLINS.—The new one is reversible; that of Mr. Rowe is not so.

H. A. Y.—We shall not have an opportunity of trying the tissue during the next fortnight.

E. H. R.—Aniline black is an article of commerce, and is said to be used in the preparation of printing-inks. We cannot inform you where it may be obtained.

G. G.—Newman, of Soho-square, publishes such a manual of colouring as you seek. We do not advise you to obtain lessons at the place and under the circumstances detailed in your letter.

B. J. RANDALL.—Although we are not acquainted with the lens marked No. 3 on the list, yet we believe, from its dimensions and focus, that it will prove more useful for your purposes than any of the others.

J. S. COX.—If the centre lens of the triple combination be removed the focus will be greatly shortened, but it will not then be converted into a portrait lens. We see nothing to prevent your using the lens intact.

W. J. S. (Birmingham).—From the fact that the pyroxyline has bleached the ink of your letter with which it was in contact it is evident that it has been very imperfectly washed. On "tasting" it we find the presence of acid abundantly manifest. It is quite unsuited for making collodion.

JOHN ROBINSON.—The two studios, although possessing some features in common, differ from each other in this respect—that the new one introduces advantages of a novel kind. We cannot speak definitely on the subject until the specification is published, when we shall learn the precise nature of the claim.

M. A. GORDON.—Make a good stiff size of gelatine, to which is added a large admixture of kaolin, and, having filled a bath with it, immerse the paper sheet by sheet, afterwards placing it in a bath of alum so as to render the gelatine insoluble. This forms what was at one time designated "porcelain paper."

Z.—The following has been strongly recommended as a solution for effecting the removal of stains from the hands:—To a saturated solution of hypochlorite of potass add as much hydrochloric acid as the skin will bear comfortably, and to this add a few grains of iodide of potassium. See our remarks on this subject in the sub-leader, page 412.

A TYRO.—The "Professor Miller" to whom you allude is more generally known as "William Allen Miller." He was professor of chemistry in King's College, and died in September, 1870, when on his way to attend the Liverpool meeting of the British Association. We are not aware of any papers on practical photography written by him, although a *précis* of its principles is given in his *Treatise on Chemistry.*

ANXIOUS says:—"I have been troubled once or twice after toning by a nasty yellow tint coming over my pictures, and I cannot discover the cause. After I had finished toning the other evening, and laid them, one by one, into the trough, when I came to take them out for the fixing bath, the first lot that were laid in the trough were as yellow as saffron. If you would be so kind as to let me know the cause in your next issue I shall feel much obliged."——In reply: the yellowness of the print enclosed is due to the formation of sulphide of silver; and this, in turn, is caused by contact with hyposulphite of soda. Probably some of this salt may have contaminated the trough to which the prints were transferred.

TOURIST.—We can readily perceive the cause of your negatives being all fogged. Whereas a nitrate bath for *collodion* negatives may be either slightly acid or quite neutral and yield clear pictures, it is indispensable that both for negatives on paper and on albumen the bath should be strongly acid. Try the following experiment:—Excite three other sheets—the first on the collodion negative bath as before; the second with a portion of the same bath containing glacial acetic acid in the proportion of one part of acid to twelve of silver; and the third with twice the proportion of acid, or as one to six. Let the developing of all of them be conducted in a similar manner. The first will be fogged; the second will be very sensitive and develope quite clean; the third will be very clean in the shadows, but rather less sensitive than the second.

M.—We are not aware of any methods of preparing durable sensitive paper than those described in the ALMANAC.

TYCHO.—To ascertain approximately the quality of the gold without analysing it ascertain its specific gravity by weighing it, first in air and then in water.

CLERICUS, M A.—A Stillman box tent, as described in our ALMANAC for 1873, page 135, will prove exceedingly efficient. We are unable to indicate the cost.

W. KERMODE (Durban, Port Natal).—We can supply all the volumes of the *Philadelphia Photographer* (except volume i.) at 30s. each. Eleven volumes have been published.

CHARLES ESDEN (Kensington).—Seeing that gelatine is not soluble in cold water we cannot account for the gelatino-bromide films dissolving under the action of the developer. Has any other correspondent had experience in this direction?

AMATEUR (Manchester) writes—"Will Colonel Stuart Wortley have the kindness to give the proportions of the thirty-grain solution of iron, glycocoll solution, and formic acid which he considers the best for use as a developer, and state whether it is suitable for dry plates?"

A JUSTICE OF THE PEACE.—Make a ten-grain solution of the permanganate, and, having poured the silver solution into a clear bottle, add the permanganate by a few drops at a time. Discontinue this addition when the solution remains of a slight pink colour after standing for about a minute.

W. G. (Torquay).—1. You ought to use a pair of achromatic eyepieces. The improvement effected by them is truly wonderful, while the cost is comparatively small. Our own only cost eight shillings.—2. The distance between the lenses ought to be so adjusted that their centres are *a little* wider apart than the distance between your eyes.

J. G. (Dewsbury).—On the subject of studio lighting see an article by Mr. G. W. Webster in the present number. Referring to retouching upon "ground-glass varnish" our correspondent says:—"As one of your correspondents has lately said that ground-glass varnish is too brittle to bear the wear of retouching and printing, and proposes to get over the difficulty by means of albumenised paper, I may remark that the formula in your ALMANAC produces a varnish capable of enduring a considerable amount of wear if made from suitable materials. In fact, negatives may be in use for months without any extraordinary precautions being taken to preserve them."

G. B. BRADSHAW.—Although the hydrometer (or argentometer) is not an accurate instrument for testing the strength of a bath after it has been in use, it is, for all that, sufficiently accurate for general photographic purposes, and proves a good guide in practice. It is theoretically unsound for the purpose indicated, because by the immersion of each collodionised plate in the bath a portion of silver is withdrawn from the solution and an equivalent portion of the nitrate of the base of the salt with which the iodiser is made is formed and liberated in the silver bath. Suppose, for instance, that there was iodide of potassium in the collodion, there would be an increasing proportion of nitrate of potash formed in the bath by the immersion of each plate, and the argentometric indications would not allow for this quantity, but would "read it off" just as if it were nitrate of silver. But, for all that, as we have said, the argentometer is sufficiently accurate for practical photographic purposes.

ACKNOWLEDGMENT OF MERIT.—From a letter we have received from Mr. George Smith, of Dornach, we are glad to learn that a high honour has been conferred upon a worthy recipient. Mr. Smith says—"In the present days of wailing and lamentation about the social status of photographers it may interest your readers to hear that the King of Holland has just sent the decoration of the order of the "Lion d'Or" of the third class to M. Braun, of Dornach. I enclose an extract from the local newspaper, in which, however, there is one error. The order in question is the principal one in Holland. The first class is reserved for crowned heads, ambassadors, &c.; the second class is limited to forty-eight; the third to ninety-six; and the fourth to double that number. It is an honourable distinction, the more so from its being both unexpected and unsolicited. His Majesty is a connoisseur, and in his private capacity a large purchaser of M. Braun's publications, which, with the exception of a somewhat extensive series of Swiss scenery, are entirely confined to reproductions in carbon of the old masters' paintings, frescoes, drawings, and statuary. His photographs of the Sixtine Chapel at Rome produced under circumstances of extraordinary difficulty of lighting, and at enormous expense for scaffoldings, special lenses, &c., would have made his reputation. I regret to hear that they are unscrupulously copied in England without his authority."

## METEOROLOGICAL REPORT,

*For the Week ending August 25, 1875.*

Observations taken at 406, Strand, by J. H. STEWARD, Optician.

THESE OBSERVATIONS ARE TAKEN AT 8.30 A.M.

| August | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 19 | 30·19 | NW | 59 | 62 | 71 | 58 | Dull |
| 20 | 30·20 | NW | 58 | 60 | 78 | 58 | Foggy |
| 21 | 30·37 | W | 59 | 63 | 76 | 58 | Dull |
| 23 | 30·13 | W | 56 | 59 | 76 | 55 | Dull |
| 24 | 29·92 | W | 56 | 62 | 76 | 55 | Fine |
| 25 | 29·89 | W | 60 | 64 | — | 57 | Fine |

CONTENTS.

THE BRITISH
# JOURNAL OF PHOTOGRAPHY.

No. 800. Vol. XXII.—SEPTEMBER 3, 1875.

## THE CHROMOTYPE PROCESS.

For photographic printing the reign of silver has been a long one, yet there is another metal, chromium, which seems destined to dethrone it. Although it was reserved for quite recent times to discover the full value of the salts of this metal, yet their great sensitiveness and the beauty of the images they yielded were pointed out by that photographic patriarch, Mungo Ponton, before even Fox Talbot and Daguerre had announced their discoveries. We find the honoured names of Herschel, Becquerel, Hunt, Bingham, and others associated with the early processes of the salts of chromium; and although for a time the triumphant blaze of silver eclipsed chromium, yet, by the persistent efforts of Poitevin, Fargier, Blair, Swan, Johnson, Woodbury, and many more, the proof that chromic salts can do for photography that which silver is unable to accomplish has at last been demonstrated by the establishment of permanent printing.

The circumstance was early noted that the chromic salts owed their sensitiveness to association with organic matter; and there is nothing in photographic progress more interesting than the ingenious methods that have been adopted to utilise this joint action of salts of chromium and organic matter. They form the base not only of the carbon process, but of the many different methods of mechanical printing; and they promise to remove the only weak point in photography—and it is a very weak one—the absence of permanence in the prints.

It is too long a story to show how by the efforts of many minds the plan was at last devised by Swan that prints equal in beauty to silver, and in their nature having the guarantee of permanence, could be produced on a commercial scale; but the chemical and mechanical means employed by Swan were ill adapted for the wants of ordinary photographers. Then Mr. J. R. Johnson's ingenious mind introduced the necessary simplicity, which appears to be carried still further by Mr. J. R. Sawyer. So far as the manipulations are concerned nothing can be more simple than pigment printing now is—certainly much more so than printing in silver.

Seeing that so many difficulties are conquered, why is silver printing persisted in? We believe that photographers do, as a rule, produce their large portraits in carbon; but why do they not produce their ordinary small portraits in the same material? Is it that they are not enterprising enough? or are they too conservative? Is it that they are unwilling to learn a new process? There may be some so influenced, but the greater number must have more substantial reasons. We believe the answer given would be that carbon answers well for large work which pays for being worked up, but that there is a fineness and a delicacy wanting which, as compared with silver, unfits carbon for small portraiture. Up to the present time there was ground for these remarks; but the modifications introduced by M. Lambert, together with the delicate tissue furnished by the Autotype Company, remove these objections, as prints can now be produced in carbon even more perfect than they can be in silver.

The general manipulations adopted by M. Lambert, and taught by him to his pupils, are of that nature that they cannot be practised in this country without violating Mr. Johnson's patent. The Autotype Company, however, being the present proprietors of this patent, have made such arrangements with M. Lambert that they all work harmoniously together, and they manufacture the special tissues and other materials required. Although M. Lambert's manipulations are similar to those of Mr. Johnson, yet they are not the same; there are variations at each turn, and each has for its object the more perfect production of the ultimate beauty of the print. The sum total of these, together with a few specialities secured by M. Lambert's own patent, constitute the mode of working known as "chromotype," and which, therefore, combines the latest improvements in the Swan, Johnson, and Lambert processes.

For the benefit of those of our readers who are familiar with carbon working we note some of the points in which M. Lambert differs from manipulators in this country. For preparing his plates, instead of wax and resin he uses wax only, employing benzole as the solvent in place of turpentine. In order to be certain to bring away from the plate all the delicate half-tones he uses a collodion substratum. This is not novel, as others have done it before; but these others have allowed the collodion film to dry, and have attached the tissue to the dried film. This we hold to be dangerous practice, as there is no security but that at some future time the collodion may detach itself from the carbon film. Some of Swan's early prints came to sad grief by the collodion splitting away from the front of the print. But M. Lambert prevents this by attaching his tissue to the *wet* film, so that, in finally drying, the wet collodion and the moist tissue, both being in a soft and pappy state, become incorporated together. This is a very different condition to attaching the tissue to a hard, skinny, repellent film such as dry collodion forms.

The usual transfer paper is prepared with a white pigment to destroy the colour of the gelatine; but M. Lambert adds also a little ultramarine colour. This has a singular capacity of heightening the brilliancy of the whites of his prints—so much so that the most recently-produced albumenised print is made to look yellow and dingy by contrast. We are aware that a blue tint has previously been given to transfer paper by the addition of other colours, but the effect was that of degrading instead of heightening the whites. It is quite otherwise when ultramarine is used.

We questioned M. Lambert about the "continuating" action of light upon exposed tissue—a subject on which considerable discussion has arisen. We found that his views varied considerably from the recognised authorities in this country; but we also found that his practice differed so considerably, and his ideas as to the best conditions of sensitising and drying, and of the most desirable hygrometric condition in which to retain the tissue, were so much at variance with these authorities, that we concluded each party might be right.

In witnessing the manipulations of M. Lambert we were much impressed not only with the simplicity and certainty with which beautiful and permanent prints were produced, but also with the superior facilities the carbon printer possesses over the silver printer. By only printing a little deeper the same materials

and the same manipulations used for making the ordinary prints will serve for producing transparencies for decorative purposes; for making stereoscopic transparencies (equal to Ferrier's, and better in colour); for producing transparencies adapted for the enlarging or the solar camera; and also for reproducing negatives. The operations for producing all these desirable things are practically one and the same.

There is also the greatest possible means of gratifying every taste in the surface of the print. It only depends on the kind of glass used for developing upon, whether plain or ground, and on the mode of mounting; the highest vitreous glaze, or that of double or single albumenised paper, or the matt appearance of plain paper, can be obtained at will and without extra trouble. For producing the so-called "cameo enamelled prints" it is only necessary to develope on plain glass and to stamp up the print, and the effect is gained without any after-trouble of collodionising and gelatinising the print. For eburneum pictures, of a colour that the late Mr. Burgess craved for but never obtained, it is only necessary, instead of attaching transfer paper, to back up with warm, white, pigmented gelatine, then to dry, strip, and the eburneum picture is complete.

We have other points to allude to, but space forbids. We cannot part with M. Lambert's process without making a passing allusion to the ingenious mechanically-registering printing and tinting-frames, in which tinted borders of any fanciful device, together with monograms, coats of arms, name and address, &c., can all be produced on the picture in the course of the printing in so simple a manner that a child can do it. These are equally as applicable to silver as to carbon work.

Permanent printing having now arrived at this stage we trust that, for the credit of photography and for the honour of the profession, the production of fading photographs will shortly cease, and that this standing opprobrium will be removed. To those who have been craving for a new size, or for a fresh mode of finishing their pictures in order to revive waning business, we say:—Here is an opportunity of introducing a real novelty—a novelty as good as it is genuine—the production of permanent portraits.

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It is to be regretted that the Chairman of the Chemical Section of the British Association did not, on Monday last, invite discussion on the paper on *Nitrite of Silver*, read by Mr. J. W. Gatehouse, of Bath. There is one peculiarity attendant upon its presence in the collodion negative bath to which we should have directed the attention of the members present with a view to its elucidation. It is well known to many that a bath made of *fused* nitrate of silver is, in the majority of cases, much more sensitive than one prepared from the usual crystals. By the act of fusion, especially if there be any organic matter present, there is a formation of the nitrite of silver, and what is worthy of notice is that when this nitrite is present in the bath the sensitiveness is greater than when the silver is present in the form of nitrate alone. We merely direct attention to this point at present, reserving a fuller consideration of the question for a future occasion, when, by carefully-conducted experiments, we shall have determined with as much accuracy as possible the precise amount of influence in respect of sensitiveness exercised by the presence of definite quantities of nitrite of silver upon the nitrate bath.

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## THE METHYLAL DEVELOPER.

Everyone who has read the various mysterious accounts from foreign sources of the power of reducing the exposure possessed by some undescribed methylic compounds when added to plain iron solutions must, when at last some definite instructions had been given, have felt it almost his duty to try it for himself, more especially when the meagre details at first obtainable had been supplemented by the interesting and concise details of experiments performed by Mr. Warnerke and the Editors respectively, the latter being well known for their experimental skill and the earnestness and energy with which they attack any problem likely to be of use or interest to their readers. But this is the busy season, and professional photographers—at the best of times rather averse from trying chemical experiments—have little time to spare even for such as might result in taking a step towards obtaining the photographer's *elixir vitæ*—instantaneous exposure.

With regard to the new agent, I believe the first working details were given in the *Moniteur* by M. Alexandre, where the product of the distillation of pure wood spirit with sulphuric acid and oxide of manganese was directed to be used. Since experiments have been made in this country the name "methylal" has been given to that product a little hastily; for, even when working with the purest materials, the distillate is very far from being able to claim the title, being, as it is, a mixture of several compounds of which methylal really forms a part only.

Methylal (whose formula would in the present state of our knowledge of the carbon compounds be more easily understood if written, as it is always now, $C_3 H_8 O_2$, the oxygen and carbon atomic weights double the old value) has a specific gravity of ·8551, the last figure, evidently by a printer's error, having been placed before the point in Mr. Warnerke's article, and, at the same time, a figure 0 after the 4 having dropped out in his formula for developer, and could only be obtained by a troublesome set of distillations of the crude product, obtained, as described, with potash, lime, &c.; but as there is no account published of the methylal itself being used I decided to experiment with such materials as were indicated by those who had obtained the successful results which have raised so many hopes. In using a pure product it was quite possible that the result would be entirely different from that arrived at by following instructions.

I have made two separate quantities of the distillate from two different samples of wood spirit, the details of making which and their photographic results in my hands I now submit to my readers.

The first sample of wood spirit was such as would be most likely used by the widely-spread body of experimentalists generally, viz., the *best* commercial wood naphtha obtainable from a first-class chemist and druggist. The distillate from this was used both crude and redistilled over carbonate of lime. M. Alexandre's statement about turpentine being mixed with the commercial article is purely imaginative; in this country methylated spirit is the adulteration most likely to be met with.

The second sample of wood spirit was the purest obtainable excepting such special laboratory products as would have to be prepared only by the experimentalist himself. It is purchasable under the name of "pyro-acetic spirit." To produce perfectly pure wood spirit or methylic alcohol it is necessary to distil a tolerably-good sample of wood spirit with oxalate of potash and sulphuric acid, decompose and redistil the product with water, and distil again from lime. This is the shortest process; there are others more complicated. Spirit of this degree of purity, I repeat, I did not use; but should any likelihood of benefit attend its use I shall not hesitate to prepare it and give the readers of the Journal the benefit of my experience. The cost of the preparation of any chemical new to photographic purposes should, in my opinion, have no weight whatever in the matter of experiment; for, not to go farther, the instance of hyposulphite of soda affords a remarkable example of the cheapening of expensive chemical agents the moment a large demand is created for them, that substance having been sold at a guinea a pound to start with, while the same sum will now purchase a hundredweight.

To return to my experiments with the first sample. The proportions of the ingredients were those given by M. Alexandre; the quantities were as follow, by measure:—

| | | |
|---|---|---|
| Sulphuric acid | 7 | ounces. |
| Methylic alcohol | 10 | „ |
| Water | 8 | „ |
| Black oxide of manganese | ¾ | pound, by weight. |

The acid is best added last, as great heat is evolved when it is mixed with wood spirit. The whole was put into a flask capable of holding half-a-gallon, and connected with a small Liebig condenser. A small Bunsen burner gave more than enough heat. The heat produced by the mixture of the chemicals is sufficient to produce an ounce of distillate, which should be returned to the flask before the Bunsen burner is lighted. I experienced no bumping, though methylic alcohol and sulphuric acid are each very troublesome to boil in that respect. In redistilling from the first lot of spirit the bumping was most severe; but with the second and purer sample no trouble whatever was experienced, which showed there was a difference in the products. Again: in the first distillation the amount of frothing was quite different from that of the second sample; the ingredients never occupied more than about twice their original bulk, while with the first the frothing almost filled the flask.

As the distillation of the first lot was proceeding, under charge of an assistant, so full was I of the promise held out that I determined to risk an experiment upon a sitter. The distillation being half com-

pleted I allowed a sufficient quantity for an ounce of developer to drop into a measure, and added the requisite amount of iron to carry out Mr. Warnerke's instructions. My very unscientific haste was righteously punished; for the negative which, the day being very even in light, I had timed as for ordinary development was worthless through fog; what image showed through seemed by no means over-exposed, and my unfortunate sitter had to sit again. I know it was very wrong to expect any good result without due methodical work; still, the result damped the ardour of my expectations, and I patiently waited till the distillation was complete. I then tried one plate, but with so little success that I determined upon the rectification over carbonate of lime, three-fourths only being drawn over. The product was used with the addition of formic acid and tried on one or two plates; but the result was so utterly unpromising that I proceeded to make a fresh distillation from the pure spirit spoken of. With this product redistilled—which, for brevity, I will call "methylal"—I proceeded to make systematic and exact trials.

Three developers were mixed in the following proportions:—

A.

| | |
|---|---|
| Sulphate of iron | 15 grains. |
| Methylal | 20 minims. |
| Formic acid | 5 „ |
| Water | 1 ounce. |

B.

| | |
|---|---|
| Sulphate of iron | 15 grains. |
| Methylal | 40 minims. |
| Water | 1 ounce. |

C.

| | |
|---|---|
| Sulphate of iron | 15 grains. |
| Glacial acetic acid | $\frac{1}{2}$ drachm. |
| Water | 1 ounce. |

The bath was what I had in daily use. The time was between five and six o'clock in the evening, the light being very uniform.

The method of comparison was to make a diamond cut on the back of the plates, expose the two halves in rapid succession, and then divide the plates in the dark room and develope each piece separately. The results were as follow, the halves of the plates being numbered consecutively from 1 upwards:—

Plate 1, exposed 30 seconds, developed with C.
„ 2, „ 15 „ „ „ A.

*Results.*—Plate 2 developed almost as quickly as plate 1, and at the first glance seemed almost as well exposed; but a slight examination showed that the negative was *very thin* in comparison with the other, and so to the casual observer an impression of equal exposure would be conveyed.

The thirty seconds' one was about the time required in ordinary working; the next pair I exposed only half the time of the first pair, thus:—

Plate 3, exposed 15 seconds, developed with C.
„ 4, „ $7\frac{1}{2}$ „ „ „ A.

*Results.*—Entirely in accordance with the first plate, the under-exposure of 4 as compared with 3 being, perhaps, more noticeable.

Feeling already doubtful of the usefulness of the new developer I gave the next pair of plates equal exposure, viz., 5 and 6 ten seconds each, developing with A and C respectively. *Results.*—Not the slightest gain; the exposure appeared identical, the thinness of the deposit being taken into account.

The next pair were developed by B, in which it will be noticed there is no acid. Plates 7 and 8 were exposed ten seconds each, and developed with B and C respectively. *Results.*—Equally unpromising; if there was a difference the old acetic acid developer had the benefit of it, and there was considerably less difference in the density of the negative.

Pondering over the matter I thought some of the discordant results, and that of others, might be explained by the use of different baths. I therefore tried some more sets with a bath that had been experimented with and discarded, which gave clear and slow but dense pictures compared with my own, which is always in the most sensitive state and suited for children's pictures, of which I take a very great number. Such an one, I need not say, gives an image beautiful, round, and soft, but scarcely dense enough without intensifying. With this discarded bath the difference in the density of the negatives was seen to a most striking extent; the difficulty in comparing exposure was increased, and there was a suspicion of an advantage in favour of the methylal developer. The details are as follow:—Plates 9 and 10 each exposed twenty seconds, and developed with A and C respectively. *Results* as above stated, but slightly, say about one second in ten, to the advantage of A.

A plate was then prepared in the slow bath, and developed according to the formula given by Dr. Nicol in last week's Journal, with sweet spirit of nitre, thus:—

Plate 11, exposed 20 seconds.
„ 12, „ 18 „

*Results.*—Precisely similar to 9 and 10. There seemed this slight advantage in the new developer—that is, these two plates were apparently exposed alike.

To make quite sure that I had correctly exercised my judgment as to exposure I tried a final pair of plates, thus:—

Plate 13, exposed 20 seconds, developed with A.
„ 14, „ 15 „ „ „ B.

*Results.*—Undoubtedly the twenty seconds' one is the better exposed of the two.

It will thus be seen that, so far as my experience goes, it is dead against the new developer, which in no way surpasses what we have had in daily use for so many years; and, so far from its enabling the developer to be kept on the plate longer than usual, the reverse is the case. It may be objected that I have only used a developer of one strength. If at that strength any indications had been offered of advantage to be gained by the new developer I should have made exhaustive trials; but nothing of the sort occurred, the failure to attain any increased sensitiveness being utter and complete.

I am very sorry to have had this conclusion forced upon me; but the inexorable "logic of facts" cannot be contended against. It is difficult to account for the discrepancy between my results and the Editors'; but it often appears that experiments most successful in the laboratory fail to stand the test of practical work.

In conclusion: I may say that, in order to observe the peculiarities of the results more fully, all the negatives described were not intensified after development. They were varnished and preserved for reference, and I shall be most happy to show them to any one interested in the methylal developer.

G. Watmough Webster, F.C.S.

## COLLODION FOR THE DRY PROCESSES.

Allow me to offer a suggestion on the best mode of preparing a collodion suitable for the dry processes. It is that we should not trust entirely to the use of weak acids in the manufacture of the pyroxyline, but should obtain the requisite porosity of the film in other ways.

I never found in my own experience that the intensity of negative collodion was increased by using weak acids; on the other hand, it was greatest when the acids were strong enough to make an entirely soluble product, and my only reason for using weak acids was to produce a limpid, structureless collodion adhering tightly to the glass.

Weak nitric acid tends to oxidise and destroy the organic reactions. A dense sample of pyroxyline digested in dilute nitric acid loses its characteristic properties, and gives a grey and metallic image. It is the other constituent, viz., the sulphuric acid, which so alters the film as to produce toughness and density; hence the proportion of this acid should be large, and that of the other small. Water should then be added until a soluble pyroxyline is obtained.

The film so produced may be too horny and contractile. To overcome this defect and produce porosity note the temperature of the acids and raise it if required. The use of an alkali is also very effectual. Shake up the collodion with dry carbonate of potash, allowing the excess to subside; or, better still, make an alcoholic solution of potash and drop it into the collodion in minute graduated quantities. It will render it thin and limpid, and the film will be opaque and powdery. The same effect will be produced in a few hours as by long keeping after iodising with iodide of potassium. On dipping this film into the bath traces of nitrate of silver will be formed, and the combination of the organic matter with the silver will be facilitated.

T. Frederick Hardwich.

## NOTES ON PASSING EVENTS.

By a Peripatetic Photographer.

Let me first of all touch on a controversial matter. Colonel Wortley still, he says, prints all his "choicest works" by the Wothlytype process. When I said that he had discontinued such a method of printing I had in my mind's eye such of his works as have been published, and such as have been publicly exhibited—those, for instance, which were put in competition for the Crawshay prizes. I have not the pleasure of being among those to whom his

"choicest works" have been exhibited. Mr. Winstanley, too, explains that his articles on the Woodbury process referred to that method of printing as it *was* rather than as it *is*; which is precisely what I thought. Still I may repeat the "*cui bono*" of my former article.

We often see some recommendations of a useful character among the *Foreign Notes;* but I do not imagine that one suggestion by a gentleman at a recent meeting of the Berlin Photographic Society will be received with favour on account of any value it may possess, for the recommendation in question consists in not using gum for fastening translucent paper to a negative that is to be operated upon—that is, retouched—but employing, in preference, *collodion* for the purpose. This is, in my estimation, a mistake, and for this very simple reason —that, whether the negative upon which operations are to be made be varnished or unvarnished, the collodion will exercise a solvent action. No alcoholic photographic negative varnish will resist the application of collodion; nor will any unvarnished film of collodion remain undisturbed under the application of a second layer of collodion. Gum-water exerts no action either on collodion or translucent paper; *ergo*, it is better than collodion as a cementing material, the *dictum* of the unnamed member of the Berlin "band of brothers" notwithstanding. What a pity it is that photographers all the world over do not speak one language! If they did, it is within the range of possibility that my unknown Berlin "brother" might have explained that it was not exactly collodion that he meant, or, at any rate, that he did not mean its employment in such a sense as that adopted by me. I, of course, assume him to have said what the translator records. The best way by which to affix a sheet of transparent paper to a negative for retouching purposes is by the application of gum-water round the margin, the paper having been previoulsy made slightly moist.

Mr. J. M. Turnbull has, I observe, introduced a new levelling-stand. It consists of a flat piece of wood in which are inserted three screwed wire eyes, which are made to assume a perfect level by the raising of either one or other of the trio. For many months I have used, with great convenience, a method suggested by the Editor of The British Journal Photographic Almanac, in a recent volume, which consists in inserting three loosely-fitting screws in the corks of as many common penny ink bottles. By screwing up one or the other of these a plate is brought to an absolute level, and, as I have applied this method to plates up to 22 × 25 inches, I can speak of its advantage with absolute confidence.

The author of an excellent article in a recent number of this Journal, entitled *Rambles and Recollections of an Amateur Photographer*, has referred to Goddard's long-focus lenses. While that optician was amongst us he manufactured and advertised as a speciality lenses of such long focus that the pictures produced by them were telescopic in their projection—by which I mean that the view obtained of any special object subtended a larger angle than it did to the eye of an observer. This leads me to observe that, so far as I am aware, there is no definite standard of angular admeasurement by which we can make a distinction between a reduced, an ordinary, and a telescopic view. It is not too much to say that by far the larger number of photographs produced are miniatures, and I am now speaking of landscapes rather than of portraits, to which class the term has hitherto been usually applied. Wherein lies the difference between a picture in miniature and one of the telescopic order? and is there any class between the two? I venture to assert that it is possible to draw a tolerably-sharp line of demarcation between the two extremes; and in order to do this I would define a telescopic view to be one which subtends a larger angle than a natural view of the same subject as seen or traced upon a plate of glass or similar medium when interposed between the eye and the subject at a distance of twelve inches from the former. I am aware that some writers on optics have assumed ten inches to be the distance for correct vision, but from a great number of trials I have made I find that twelve inches is more correct as an average. Hence I deduce the following law:—A telescopic view is one projected on a scale larger than would be the angles from the same subject if compared with the said telescopic view when held at a distance of a foot from the eye of the spectator. Everything less than this will be smaller than it appears to be in nature, and will, therefore, be in miniature. There are degrees of miniature representation as there are degrees of telescopic representation; but the point in which the picture assumes the same apparent dimensions as when a projection is made at the distance of a foot from the eye must form the line which distinguishes a telescopic from a miniature view. Goddard made many landscape lenses of upwards of thirty or forty inches in focal length; and, as this very far exceeds the focus requisite to produce the neutral conditions which I have described, such lenses must have been telescopic to a very great degree. Here another question arises—Is there any good reason why *portraits* should not be produced of dimensions much in excess of the natural size? At present the great mass of portraits are miniatures; why should this be so?

## THE LANTERN.

Who ever heard of the lantern in the early days of September? True, gentle reader; and just because of that truth do I beg of you to attend for a few minutes while I endeavour to convince you that it is a mistake to permit the lantern to lie uncared for and forgotten till the time comes when it *must* be brought into use. Time was when that instrument was something of a novelty and very much of a toy—when any rude outline of a picture, especially if daubed over with colour, was gazed on with admiration by those for whose delectation it was exhibited; but, thanks to photography, this state of matters has long since passed away, and some of the best landscape photographers in the country do not think it beneath their powers to prepare pictures suitable for lantern exhibitions from their finest negatives. To those of my readers—and I hope they are very numerous—who are in the happy position of being able to get away for a week or two, camera in hand, I would say, as a seasonable piece of advice, read again the short article by Mr. Frank Howard, at page 123 of The British Journal Photographic Almanac, entitled *A Photographic Suggestion Yet to be Developed*, and, having done so, proceed to act on the hints therein given as far as possible.

I think it is generally admitted that, fine as some of our paper prints undoubtedly are, the very best of them fall far short of the beauty and brilliancy of a first-class transparency on glass. So truly is this the case that I know one amateur at least, whose work in his own particular line has never been equalled, who never makes a print on paper, but reproduces all his work on glass, and in sizes ranging from $3\frac{1}{4} \times 3\frac{1}{4}$ to $8\frac{1}{2} \times 6\frac{1}{2}$; and I am sure that all who have had an opportunity of examining his productions are convinced that they are, perhaps without exception, the most charming specimens of photography that have ever been submitted to public criticism. Why are the productions of that particular amateur so much better than those of nearly every other photographer? A very natural question, and one very easily answered. His negatives have all been specially taken with that object in view, and, in consequence, would give very indifferent paper prints if he were to use them for that purpose.

I do not, of course, advise my readers to follow his example implicitly and exclude paper prints from their work; but I think it is equally a mistake in those who possess lanterns, and desire to turn their negatives to account in making transparencies, to confine their attention to the production of such negatives merely as will yield the highest class of paper prints. What I advise is that those of my readers already alluded to should, whenever they photograph any picture specially suitable for exhibition in the lantern, make *two* negatives—one to be brought up in any way that their experience may have taught them to the best condition for paper printing; the other to be reserved for the production of transparencies and to be manipulated accordingly.

I have frequently had an opportunity of examining the negatives of the gentleman to whom I have already referred, and, as I believe his transparencies to be almost unrivalled, I may fairly assume that they possess in a high degree the qualities necessary for that class of work. They are all fully—very fully—exposed, and have the appearance of being very much under-developed; that is, they are quite full of detail, even in the deeper shadows, but so thin that the higher lights are transparent, no portion of the picture being in the least degree opaque. On the same authority, also, I say that such negatives should not be varnished, as even the thin film of ordinary photographic varnish sadly interferes with the production of the highest class of transparencies. This, of course, implies the necessity for greater care in handling them while printing; but he who aims at the best results will not grumble at any necessary precautions. I am, of course, aware that there are many who maintain that a good printing negative will be equally suitable for producing transparencies. This is true to a certain extent and up to a certain standard; but when even the best class of work is aimed at nothing short of specially-made negatives will be found to answer the intended purpose.

By way of showing what such negatives as I recommend will do I may mention that I have seen less than a square inch enlarged to $8\frac{1}{2} \times 6\frac{1}{2}$ without the slightest apparent loss of detail, or appearance

of coarseness or granularity, and that not from a picked negative, but from at least two dozen—taken, not for any particular photographic quality, but to illustrate a special branch of the subject with which they were connected. I have also seen lantern pictures prepared from the same small portions of a negative projected on a screen twenty-four feet square, in which the markings on shells found in the sand and inscriptions cut in the stones were as distinct as if they had been ordinary microscopic preparations examined in the usual way.

Presuming, then, that my readers have occupied a portion of their time in the production of the kind of negatives here indicated, the printing of the transparencies becomes a simple matter. The best arrangement is undoubtedly the copying camera; but those who do not possess that useful article can do very well without it. First-rate pictures may easily be made in an ordinary room, with the ordinary camera, if the lens be short enough in the focus; that is, if the camera can be drawn out sufficiently far. A hole should be cut in the window shutter the size of the negative, which must be placed at such an angle as to clear house tops or trees that may be in front. The camera should be arranged on a firm table, and supported at such an angle that the ground glass and the negative shall be in the same plane, when, with wet collodion and a somewhat old and discoloured iron developer, the work will be found plain sailing.

Considerable diversity of opinion exists as to the best colour for the transparency. The grey generally produced by the iron is not attractive, neither do I like the more popular purplish-blue given by gold toning. Probably the public taste would be best met by the warm purple-brown that is easily got by a mixture in suitable proportions of gold and palladium.

In whatever way the end may be gained I hope to hear that a large number of my readers have during the present outdoor season turned their attention to lantern work, so that by the time the lantern season comes round they will possess, not only a large collection of high-class transparencies, but many duplicates of each; then, by a system of exchange, the stock of each may be largely increased, and, correspondingly, the usefulness of the lantern, both as an educational agent and as a means of passing a leisure hour, greatly extended. In this way, too, the amateur may not only re-enjoy his autumn tour and his various pleasant outings in the company of his friends at the fireside, but he would have an opportunity of comparing his own with the work of many others, thereby learning what to avoid as well as what to emulate.

John Nicol, Ph.D.

# British Association.

## BRISTOL MEETING, 1875.

For a second time Bristol has entertained the British Association for the Advancement of Science, and it must be recorded to the credit of the western capital that the forty-fifth annual congress has been one which has been in every respect successful. Since the first meeting of the Association in Bristol, in 1836, the world has progressed rapidly; for it was at that meeting that Dr. Lardner, in the Mechanical Section, declared that the then proposed scheme of crossing the Atlantic by steam was a chimera—a dream impossible of realisation—the historical sequel being that it was from this very city the first steamship was despatched to America. And who can realise all the changes that have taken place since that time? Viewed from the vantage ground of 1875 we can almost assert that forty years ago the world was young; and such is the rapidity with which science is advancing that it is more than probable that, after the lapse of another period of forty years, the mental vision of the coming generation will have attained such an exalted altitude as to cause our now boasted high level to sink even lower by comparison with that of the future epoch.

The reception-rooms, as well as those in which most of the sectional and other meetings were held, were in Clifton rather than in Bristol proper. The former place, we may observe, although at one time a suburban village—if "village" it could even then have been termed—eventually became an important suburb; while now it may be assumed to be federated with Bristol, bearing a similar relationship to the latter city that the "West End" does to the Metropolis, and where are erected the palatial residences of the wealthier citizens of Bristol and those attracted hither by the natural beauties and health-promoting influences of the neighbouring downs. Clifton differs essentially from Bristol both in aspect and character; for, while the latter with its quaint, narrow streets, its bustling commerce, its picturesque and medieval houses, its very numerous old churches, nestles down on a level with the river Avon, which flows through the city, and with the large docks which branch from that river, the former occupies a rapidly-ascending slope, terrace upon terrace rising on the hill side, and overlooking in many instances the precipitous yet lovely banks of the Avon. Viewed from any neighbouring eminence Clifton, with its crescents and villas embedded in verdure, forms a most attractive natural picture, and satisfies the spectator that in claiming to be the Queen of Watering-places she demands no more than will readily be conceded by all visitors to this delightful adjunct of Bristol. Need it, therefore, be wondered at that in such a picturesque old city and its charming vicinity the members and associates of the Association passed a truly enjoyable week?

The formal proceedings commenced on Wednesday, the 25th ult., with an address by the President, Sir John Hawkshaw, F.R.S. The general meetings, and also the lectures and *soirées* given in connection with the Bristol meeting of the Association, were held at the Colston Hall—a large and commodious building named after one of the most honoured of the merchant princes of Bristol who flourished two hundred years ago, and spent in the true spirit of philanthropy, which flowed in numerous channels, a large fortune amassed during a long and successful career as a West India merchant and sugar refiner. As was anticipated the President's annual address was this year devoted to subjects allied to mechanical science, and, as such, of comparatively little interest to our readers considered as photographers. After a review of the rise and progress of engineering among the nations of antiquity the President dilated on the present state of that science, referred to electric telegraphy, to our coal supply, and to the probable discovery of new forces, as well as to the certain improvement of those with which we are at present acquainted.

There were three public lectures of a popular nature delivered during the week of the Association meetings. The first was by Mr. W. Spottiswoode, F.R.S., *On the Colours of Polarised Light.* The lecture was illustrated—Mr. Cottrel, of the Royal Institution (Professor Tyndall's assistant), "presiding" at the lantern, which was illuminated by the electric light. The illustrations were not so successful or effective as they might have been, being in many respects greatly inferior to those shown at such popular places of entertainment as the Royal Polytechnic Institution. After a few words on the wave theory of light, Mr. Spottiswoode laid down the objects of his lecture, "to examine how crystals, themselves perfectly colourless and transparent, are capable of producing colour;" "to show the general action of crystals on light," and "to prove independently that such action will give rise to colour;" and, lastly, that "the spectrum will offer a visible explanation of the many complicated effects of colour and form." In order to carry out these objects it was necessary, in the first place, to explain and demonstrate that in a ray of unpolarised light the vibration of the etherial particles was made in plains resolvable into two at right angles, but that a polarised beam was wanting in one of these sets of vibration; this was done by means of a pair of tourmalines. Secondly, that in the passage of a beam through certain crystals one set of vibrations took one direction and the other a different one, so that on their emergence there are two beams instead of one beam, each of which is in this polarised condition, and therefore available for the demonstration of its phenomena. Thirdly, the "retardation of waves" in their passage through crystals was beautifully shown by means of spheres of Iceland spar and water, the former of these being a magnificent specimen of the crystal, and is probably to the scientific man priceless. These preliminary notions having been cleared away the delicate and difficult subject of interference of waves was touched upon and illustrated by the projection of Newton's rings on the screen, viewed both by compound and monochromatic light, and in this way the special object of the discourse was brought forward, as was also the grand polariscope, which had, in conjunction with two or three "direct vision prisms," to do the greater portion of the remaining work of the evening.

The other lectures were, respectively, one by Dr. Carpenter to working men, *On a Piece of Chalk*, also illustrated by the lantern, and one by Mr. F. J. Bramwell, C.E., *On Railway Safety Appliances.*

There were, as usual, two *soirées* given in connection with the meeting of the Association. These were numerously attended. At the first, held on the 26th ult., there was a large display of microscopes—somewhere about a hundred and twenty. It was originally intended that the exhibition should be confined to living objects, but the intention was not strictly carried out. Among the objects shown was the crystallisation of nitrate of silver, which attracted much attention. There were numerous fine instruments present, of both monocular and binocular forms. A splendid microscope, with a rectangular prism so arranged as to enable the spectator to look in

a horizontal direction while the object glass stood vertically, was greatly admired. It was exhibited by Mr. Braham, of Bath. A number of microphotographs, by a Liverpool amateur photographer, Mr. Lewis Hughes, were also among the objects which attracted attention.

At the second *soirée*, which was held on Tuesday last, the 31st ult., there was no feature presented of a special character, with the exception of a very large collection of telegraphic instruments, Geissler vacuum tubes, and spectroscopes.

The number of tickets taken at the Bristol meeting were—Old life members, 240; new ditto, 36; old annual members, 307; new ditto, 93; associates, 884; ladies, 672; foreigners, 17. Total, 2,249. Money received, £2,397.

The meeting was adjourned to Glasgow, September 6, 1876, Professor Sir Robert Christison, President-elect. Plymouth has been selected as the place of meeting for 1877.

### Section A.—Mathematical and Physical Science.

*Thursday, August* 26, 1875.

The opening address of Professor Balfour Stewart was in a large measure devoted to solar physics, and constitutes an invaluable epitome of our knowledge concerning that orb with which photographic science is so intimately associated. Referring to the recent decease of the veteran astronomer, Schwabe, of Dessau, he said it was now fifty years since he first began to produce daily sketches of the spots that appeared upon the sun's surface, and this was continued without intermission every day for forty years. Such unexampled perseverance met with its reward in the discovery of the periodicity of sun-spots—phenomena which very speedily attracted the attention of the scientific world. "It is not easy," continued Professor Stewart, "to over-rate the importance of the step gained when a periodicity was found to rule these solar outbreaks. *A priori* we should not have expected such a phenomenon. If the old astronomers were perplexed by the discovery of sun-spots, their successors must have been equally perplexed when they ascertained their periodicity; for while all are ready to acknowledge periodicity as one of the natural conditions of terrestrial phenomena, yet everyone is inclined to ask what there can be to cause it in the behaviour of the Sun himself. Manifestly it can only have two possible causes. It must either be the outcome of some strangely-hidden periodical cause residing in the Sun himself, or must be produced by external bodies, such as planets, acting somehow in their varied positions on the atmosphere of the sun; but, whether the cause be an internal or external one, in either case we are completely ignorant of its nature."

Stimulated by the success which had attended the labours of Schwabe Mr. Carrington, an English astronomer, was the next to enter the field of solar research. The chief aim of this observer was to obtain accurate records of the positions, sizes, and shapes of the various sun-spots, and during the seven years extending from the beginning of 1854 to the end of 1860 he sketched with great accuracy every sun-spot that made its appearance, determining also its heliographic position—that is to say, its solar latitude and longitude. One of the most prominent results of Mr. Carrington's labours was the discovery of the fact that sun-spots appear to have a proper motion of their own—those nearer the solar equator moving faster than those more remote. Another was the discovery of changes, apparently periodical, affecting the disposition of spots in solar latitude. It was already known that sun-spots confined themselves to the sun's equatorial regions; but Mr. Carrington had shown that the region affected was liable to periodical elongations and contractions, although his observations had not been sufficiently extended to determine the exact length of this period. But previous to the close of Mr. Carrington's series of observations photography had been pressed into the service, celestial photography having been introduced by Mr. Warren De la Rue, at first in his own private observatory, although he next persuaded the Kew Committee of the British Association to allow the systematic photography of the sun to be carried on at their observatory under his superintendence, and in the year 1862 the first of a ten years' series of solar photographs was begun. Before this date, however, Mr. De la Rue had ascertained, by means of his photoheliograph, on the occasion of the total eclipse of 1860, that the red prominences surrounding the eclipsed sun belong, without doubt, to our luminary himself.

The Kew observations are not yet finally reduced, but already several important conclusions have been obtained from them by Mr. De la Rue and the other Kew observers. In the first place the Kew photographs confirm the theory of Wilson that sun-spots are phenomena the dark portions of which exist at a level considerably beneath the general surface of the sun; in other words, they are hollows or pits, the interior of which is of course filled up with the solar atmosphere. The Kew observers were likewise led to associate the low temperature of the bottom of sun-spots with the downward carriage of colder matter from the atmosphere of the sun, while the upward rush of heated matter was supposed to account for the faculæ or bright patches which almost invariably accompany spots. In the next place, the Kew observers, making use not only of the Kew series, but of those of Schwabe and Carrington, which were generously placed at their disposal, have discovered traces of the influence of the nearer planets upon the behaviour of sun-spots. This influence appears to be of such a nature that spots attain their maximum size when carried by rotation into positions as far as possible remote from the influencing planet; that is to say, into positions where the body of the sun is between them and the planet. There is also evidence of an excess of solar action when two influential planets come near together. But, although considerable light has thus been thrown on the periodicity of sun-spots, it ought to be borne in mind that the cause of the remarkable period of eleven years and a-quarter, originally discovered by Schwabe, has not yet been properly explained. The Kew observers have likewise discovered traces of a peculiar oscillation of spots between the two hemispheres of the sun; and, finally, their researches will place at the command of the observers the data for ascertaining whether centres of greater and lesser solar activity are connected with certain heliocentric positions.

While the sun's surface was thus being examined both telescopically and photographically the spectroscope came to be employed as an instrument of research. It had already been surmised by Professor Stokes that the vapour of sodium at a comparatively low temperature forms one of the constituents of the solar atmosphere, inasmuch as the dark line D in the spectrum of the sun coincides in position with the bright line given out by incandescent sodium vapour.

This method of research was greatly extended by Kirchhoff, who soon found that many of the dark lines in the solar spectrum were coincident with the bright lines of sundry incandescent metallic vapours, and a good beginning was thus made towards ascertaining the chemical constitution of the sun.

The new method soon brought forth further fruit when applied in the hands of Huggins, Miller, Secchi, and others to the more distant heavenly bodies. It was speedily found that the fixed stars had constitutions very similar to that of the sun; but a peculiar and unexpected success was attained when some of the nebulæ were examined spectroscopically. To-day it seems (so rapidly has knowledge progressed) very much like recalling an old superstition to remind you that until the advent of the spectroscope the irresolvable nebulæ were considered to be gigantic and remote clusters of stars, the individual members of which were too distant to be separated from each other even with a telescope like that of Lord Rosse. But Mr. Huggins, by means of the spectroscope, soon found that this was not the case, and that most of the nebulæ which had defied the telescope gave indications of incandescent hydrogen gas. It was also found by this observer that the proper motions of some of the fixed stars in a direction to or from the earth might be detected by means of the displacement of their spectral lines—a method of research which was first enunciated by Fizeau. Hitherto in such applications of the spectroscope the body to be examined was viewed as a whole. It had not yet been attempted to localise the use of this instrument so as to examine particular districts of the sun—as, for instance, a sun-spot, or the red flames already proved by De la Rue to belong to our luminary. This application was first made by Mr. Lockyer, who, in the year 1865, examined a sun-spot spectroscopically, and remarked the greater thickness of the lines in the spectrum of the darker portion of the spot.

Dr. Frankland had previously found that thick spectral lines correspond to great pressure, and hence the inference from the greater thickness of lines in the umbra of a spot is that this umbra or dark portion is subject to a greater pressure; that is to say, it exists below a greater depth of the solar atmosphere than the general surface of the sun. Thus the results derived from the Kew photoheliograph and those derived from the spectroscope were found to confirm each other. Mr. Lockyer next caused a powerful instrument to be constructed for the purpose of viewing spectroscopically the red flames round the sun's border, in the hope that if they consisted of ignited gas the spectroscope would disperse, and thus dilute and destroy, the glare which prevents them from being seen on ordinary occasions.

Before this instrument was quite ready these flames had been analysed spectroscopically by Captain Herschel, M. Janssen, and others, on the occasion of a total eclipse occurring in India, and they were found to consist of incandescent gas, most probably hydrogen. But the latter of these observers (M. Janssen) made the important observation that the bright lines in the spectrum of these flames remained visible even after the sun had reappeared, from which he argued that a solar eclipse is not necessary for the examination of this region.

Before information of the discovery made by M. Janssen had reached this country the instrument of Mr. Lockyer had been completed, and he also found that by its means he was able to analyse at leisure the composition of the red flames without the necessity of a total eclipse. An atmosphere of incandescent hydrogen was found to surround our luminary, into which, during the greater solar storms, sundry metallic vapours were injected, sodium, magnesium, and iron forming the three that most frequently made their appearance.

Here we come to an interesting chemical question.

It had been remarked by Maxwell and by Pierce, as the result of the molecular theory of gases, that the final distribution of any number of kinds of gas in a vertical direction under gravity is such that the density of each gas at a given height is the same as if all the other gases had been removed, leaving it alone. In our own atmosphere the con-

tinual disturbances prevent this arrangement from taking place; but in the sun's enormously-extended atmosphere (if, indeed, our luminary be not nearly all gaseous) it appears to hold, inasmuch as the upper portion of this atmosphere, dealing with known elements, apparently consists entirely of hydrogen. Various other vapours are, however, as we have seen, injected from below the photosphere into the solar atmosphere on the occasion of great disturbances, and Mr. Lockyer has asked the question whether we have not here a true indication of the relative densities of these various vapours derived from the relative heights to which they are injected on such occasions.

This question has been asked, but it has not yet received a definite solution; for chemists tell us that the vapour densities of some of the gases injected into the sun's atmosphere on the occasion of disturbances are, as far as they know from terrestrial observations, different from those which would be indicated by taking the relative heights attained in the atmosphere of the sun. Mr. Lockyer has attempted to bring this question a step nearer to its solution by showing that the vapours at the temperatures at which their vapour densities have been experimentally determined are not of similar molecular constitution, whereas in the sun we get an indication, from the fact that all the elements give us line spectra, that they are in similar molecular states.

Without, however, attempting to settle this question, I may remark that we have here an interesting example of how two branches of science —physics and chemistry—meet together in solar research.

It had already been observed by Kirchhoff that sometimes one or more of the spectral lines of an elementary vapour appeared to be reversed in the solar spectrum, while the other lines did not experience reversal. Mr. Lockyer succeeded in obtaining an explanation of this phenomenon. This explanation was found by means of the method of localisation already mentioned.

Hitherto, when taking the spectrum of the electric spark between the two metallic poles of a coil, the arrangements were such as to give an average spectrum of the metal of these poles; but it was found that when the method of localisation was employed different portions of the spark gave a different number of lines, the regions near the terminals being rich in lines, while the midway regions give comparatively few.

If we imagine that in the midway regions the metallic vapour given off by the spark is in a rarer state than that near the poles, we are thus led to regard the short lines which cling to the poles as those which require a greater density or nearness of the vapour particles before they make their appearance; while, on the other hand, those which extend all the way between the two poles come to be regarded as those which will continue to make their appearance in vapour of great tenuity.

Now it was remarked that these long lines were the very lines which were reversed in the atmosphere of the sun; hence, when we observe a single coincidence between a dark solar line and the bright line of any metal, we are further led to inquire whether this bright line is one of the long lines which will continue to exist all the way between two terminals of that metal when the spark passes.

If this be the case, then we may argue with much probability that the metal in question really occurs in the solar atmosphere; but if, on the other hand, the coincidence is merely between a solar dark line and a short bright one, then we are led to imagine that it is not a true coincidence, but something which will probably disappear on further examination. This method has already afforded us a means of determining the relative amount of the various metallic vapours in the sun's atmosphere. Thus, in some instances, all lines are reversed, whereas in others the reversal extends only to a few of the longer lines.

Several new metals have thus been added to the list of those previouly detected in the solar atmosphere, and it is now certain that the vapours of hydrogen, sodium, rubidium, barium, strontium, calcium, magnesium, aluminium, iron, manganese, chromium, cobalt, nickel, titanium, lead, copper, cadmium, zinc, uranium, cerium, vanadium, and palladium occur in our luminary.

I have spoken hitherto only of telescopic spectroscopy; but photography has been found capable of performing the same good service towards the compound instrument consisting of the telescope and its attached spectroscope which it had previously been known to perform towards the telescope alone. It is of no less importance to secure a permanent record of spectral peculiarities than it is to secure a permanent record of telescopic appearances. This application of photography to spectrum observations was first commenced on a sufficient scale by Mr. Rutherfurd, of New York, and already promises to be one of the most valuable aids in solar inquiry.

In connection with the spectroscope I ought here to mention the names of Respighi and Secchi, who have done much in the examination of the solar surface from day to day. It is of great importance to the advancement of our knowledge that two such competent observers are stationed in a country where the climate is so favourable to continued observation.

The examination of the sun's surface by the spectroscope suggests many interesting questions connected with other branches of science. One of these has already been alluded to. I may mention two others put by Mr. Lockyer, premising, however, that at present we are hardly in a position to reply to them. It has been asked whether the very high temperatures of the sun and of some of the stars may not be sufficient to produce the disassociation of those molecular structures which cannot be disassociated by any terrestrial means; in other words, the question has been raised whether our so-called elements are really elementary bodies.

A third question is of geological interest. It has been asked whether a study of the solar atmosphere may not throw some light upon the pecular constitution of the upper strata of the earth's surface, which are known to be of less density than the average interior of our planet.

If we have learned to be independent of total eclipses as far as the lower portions of the solar atmosphere are concerned, it must be confessed that as yet the upper portions—the outworks of the sun—can only be successfully approached on these rare and precious occasions. Thanks to the various government expeditions despatched by Great Britain, by the United States, and by several continental nations—thanks, also, to the exertions of Lord Lindsay and other astronomers—we are in the possession of definite information regarding the solar corona.

In the first place, we are now absolutely certain that a large part of this appendage unmistakably belongs to our luminary; and, in the next place, we know that it consists, in part at least, of an ignited gas giving a peculiar spectrum which we have not yet been able to identify with that of any known element. The temptation is great to associate this spectrum with the presence of something lighter than hydrogen, of the nature of which we are yet totally ignorant.

A peculiar physical structure of the corona has likewise been suspected. On the whole, we may say that this is the least known, while it is perhaps the most interesting, region of solar research. Most assuredly it is well worthy of further investigation.

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*Friday, August* 27, 1875.

## THE TRANSIT OF VENUS.

The Rev. S. J. Perry gave a short address upon *The Transit of Venus*. He said that the observation of the transit was undertaken to determine the distance of the sun from the earth—a matter of much importance, because that distance forms the unit of astronomical measurements, and upon it depends the accurate knowledge of the real distances of the planets and fixed stars. It also affects the accuracy of the lunar tables and all attempts to determine the real phases of the moon, and this furnishes the chief motive for incurring all the trouble and expense of making observations of the last transit. Venus in transit appears to be nothing but a black spot crossing the sun's disc, and the thing the observers had to do was to ascertain the exact time in which the spot travelled across the face of the sun. These observations had to be made as far north and as far south as possible; those to the north saw the planet crossing lower down on the sun's disc than those in the south, the position of the latter tending to throw the path of the planet more off the sun's disc. He was one of the observers who went with the English expedition to Kerguelen's Land from the Cape of Good Hope. The island, when the expedition reached it, was found to be covered with snow. They established three observing stations about eight miles apart, the Americans had a fourth, and the Germans a fifth. At the chief station a portion of the transit was obscured by a cloud; but altogether the expedition was fairly successful in obtaining results. He thought it would be about seven years before the calculations connected with the various observations could be finished.

The President (Dr. Balfour Stewart, F.R.S.) in the course of the discussion said that he was not aware of any absolute evidence that the sun had a solid nucleus. Even the dark portions at the bottom of the spots might be composed of matter carried down from above. At the same time there was evidence of a one-sidedness in the sun; in other words, that it was not the same all round. Not only was it apparently lop-sided, but one region affected the magnetism and meteorology of the earth differently from the other.

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*Monday, August* 30, 1875.

## ON THE RATIO OF THE ACTINIC POWER TO THE ILLUMINATING POWER OF MAGNETO-ELECTRIC MACHINES.

By Captain Abney, R.E., F.R.A.S.

Having been called upon lately by the War Office to undertake the photometric measurement of certain magneto-electric lights I determined to carry out actinic measurements of their value at the same time, believing that the eye observations would be closely checked by such an independent method.

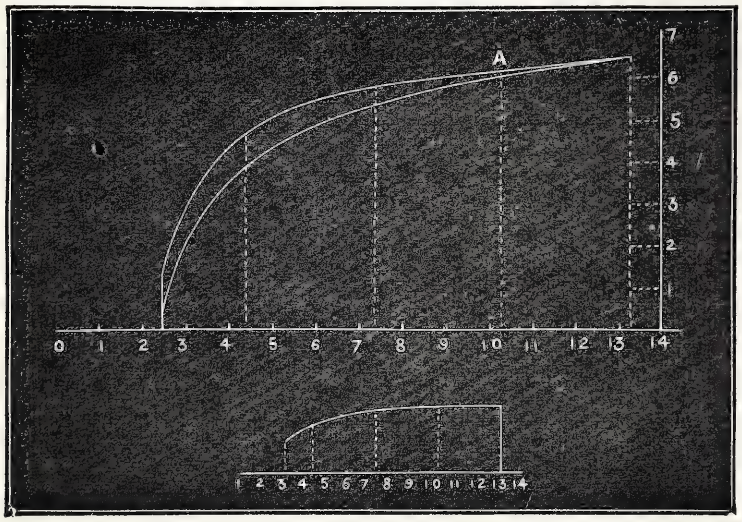
In the first comparison of the results obtained by both kinds of measurement I found that a considerable discrepancy occurred. In the values given to the different lights the photographic records could not err unless through gross carelessness in the chemical preparations, and against this every precaution has been taken. I was, therefore, inclined to throw the blame on the eye observations. A more critical examination convinced me, however, that both were correct; that, though the curves obtained for the value of the lights did not coincide, yet that they did act as a check one upon the other. In all there were six different machines to examine. Each one was driven by a ten horse-power engine. Several were driven at various speeds that the difference in the light caused by the variation might be tested. It was thus that

valuable data were acquired which I hope may prove of further scientific use.

The eye observations were made with a little instrument which I have called a "diaphanometer," which is described in the monthly notices of the Royal Astronomical Society of June of this year. The principle of the instrument is the employment of movable black glass wedges to reduce the power of the light to be measured, which light passes through the bottom half of a slit; through the top half of the slit the light of comparison is thrown by means of a prism of total reflection. This light can also be reduced by means of similar dark glass wedges. The results obtained by this instrument have been uniform, and I had the greatest confidence in its accuracy.

The method adopted of registering the actinic power of the light was by exposing uniformly-sensitive chloride of silver paper to the action of its rays. Two registrations were carried out with each light. Firstly, paper was exposed to the naked light at a fixed distance from the carbon prints for three minutes; and, secondly, a strip of the same paper was exposed beneath black wedges of slight taper for sixteen minutes. The eye observations were carried on simultaneously with the latter exposure of the sensitive paper, in both cases obtaining an integration, as it were, of the light during that period. Between ten and twenty observations were taken for each light; at the beginning, middle, and end of each trial diagrams of the steam pressure were taken in the usual manner. Diagrams were also taken of the steam pressure when driving the machine without exciting a current at the same speed as that at which the light was produced. They were also taken in many cases when the machines were what we may call "short-circuited." The data were thus obtained for calculating the power necessary to produce a light of a certain value. As various machines which are in the market were under consideration I am precluded from giving the results of any particular form.

The upper diagram gives the mean of the results of a series of experiments with one instrument. The top curve, deduced from eighty




readings, gives what I may call the "optical" value; the lower curve, taken from 450 readings, gives actinic value; whilst the bottom diagram shows the ratio of the actinic to the optic value. The weakest part of the curve is about A, where it seems to be deficient in convexity.

The curves are instructive, showing the rapid decrease of the optical, and still more of the actinic, value of the light when worked with low motive power. They also show that each machine has a point beyond which the increase in motive power is not compensated for by increase of light, the curves apparently becoming asymptotic.

I was not at all prepared for the great diminution in the value of actinic power in the lights, though I expected it in a smaller degree. The earlier experiments of Draper and others have shown that with increase of temperature the more refrangible portions of the spectrum appear after the least refrangible; but I know of no measurements which would have been applicable to the present set of experiments. The curves must evidently be some function of the wave lengths, and I hope to carry out other experiments on fixed portions of the spectrum in order to ascertain if the formula, which I think should hold good, can be employed.

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*Tuesday, August* 31, 1875.

## PHOTOGRAPHING THE TRANSIT OF VENUS.

Dr. J. Janssen, the eminent French astronomer, addressed the section on four subjects, and was listened to with great interest and attention. His first was with regard to the total solar eclipse of April 5, 1875, which he had observed at Bangchallo, in Siam, when one of the band of observers acting at the suggestion of Mr. Lockyer. Still more interesting were his remarks on the photographic revolver, and the observations of the transit of Venus made by him in Yokohama, Japan, as one of the French observers. The principal value of his observations was that he was able to see the planet Venus some ten minutes before its external contact with the sun, and was able to take successful photographs just after ingress and also during the transit. He had also been able to note the atmospherical appearance of the planet as it came before the sun's disc.

The Rev. S. J. Perry (who read an interesting paper on a similar subject last Friday) said that Dr. Janssen was the only person who had been able to clearly observe the planet before the point of contact. He had not used the spectroscope for that purpose, but simply coloured glass, and he believed Dr. Janssen's method would be largely followed in the transit of 1882.

Dr. Janssen subsequently read papers *On the Actual Position of the Magnetic Equator (Inclination and Declination) in the Gulf of Siam and Bay of Bengal*, and *On Mirage at Sea*. Dr. Janssen has observed very curious phenomena of mirage in the sea, and specially in the Gulf of Siam, that proved the existence of a reflective power at a certain height above the surface of the sea.

Professor Everett, who had paid great attention to the subject, said wherever there was a layer of heat, whether upon the surface of the sea or on land, there would be an apparent reflection produced, but it was not a real reflection.

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Section B.—Chemical Science.

*Monday, August* 30, 1875.

## ON NITRITE OF SILVER.

By J. W. Gatehouse.

The following experiments were undertaken in consequence of having been, during this last season, applied to several times by photographers to investigate for them the reason of a certain deteriorating action, termed by them "woolliness," to which they found their nitrate of silver sensitising baths exposed. Having noticed in several of these cases the presence of *nitrite of silver* in the bath it appeared advisable to investigate the properties and mode of production of this silver salt more fully than yet appears to have been done.

As regards its formation this may be accomplished in various ways by many reducing agents, from nitrate of silver:—

1. By precipitation with the nitrite of an alkali.
2. By the long-continued action of certain organic salts, such as are found in the nitrate of silver photographic baths.
3. By fusion of nitrate of silver with organic matters.
4. During the electrolysis of nitrate of silver solutions.
5. By the precipitation of silver from neutral solutions of the nitrate by means of certain metals.

I propose to investigate these various methods *seriatim*, noticing under each head any peculiarities which may present themselves.

*First.*—When nitrite of potash is added to a neutral solution of nitrate of silver a dense, yellowish-white precipitate soon settles down, which, viewed under the microscope, is seen to consist of aggregations of needle-shaped crystals, slowly changing colour on exposure to light, and ultimately becoming black. This precipitate is soluble both in nitric acid and ammonia, in the former of which it suffers decomposition, being reconverted into nitrate of silver. The ammoniacal solution deposits crystals of a beautiful fern-like form. The precipitate is slightly soluble in cold, and largely soluble in boiling, water—the solution depositing as it cools long, rectangular, needle-shaped crystals of a beautiful golden-yellow colour.

*Second.*—Nitrite of silver appears to be produced under certain circumstances, such as those found during the sensitising of collodionised plates in photographic manipulations, the amount actually produced being always very trifling; but by the evaporation of the bath to dryness the organic matters present frequently reduced large quantities of the nitrate of silver to the state of nitrite. Whether the nitrite of silver is the cause of the deterioration of the bath has not yet been determined.

*Third.*—When pure nitrate of silver is fused and the temperature raised much above the point of fusion this salt is converted into metallic silver without formation of nitrite, but should organic matter be present nitrite of silver is invariably produced. 100 grains of nitrate of silver having been carefully fused, and 2·28 grains of starch cautiously added, 4·4 grains of metallic silver were produced, together with 2·11 grains of nitrite of silver, the latter being estimated from the nitrous acid found after precipitation of the silver with ammonium chloride, and estimation with permanganate of potash. This estimation was effected by adding a large quantity of water to the precipitated solution, which was then decanted, rendered slightly acid with pure sulphuric acid free from the oxides of nitrogen, and then triturated with a solution of permanganate of potash containing seventy-nine grains per litre, each cubic centimetre of which corresponded to 0·475 grains of $N_2O_3$.

*Fourth.*—During the electrolysis of concentrated solutions of nitrate of silver, using platinum electrodes, metallic silver is deposited on the negative, whilst a black crystalline deposit adheres to the positive pole. After the action has proceeded for some time these crystals become surrounded with a yellowish-brown solution, and as this increases the formation of the crystals diminishes, they being ultimately replaced by a black powder which falls to the bottom of the vessel. These crystals,

stated by Fownes (tenth edition) to consist of silver dioxide, and by Boettger to be peroxide of silver, are decomposed at a temperature of 50° C., yield oxygen when treated with concentrated sulphuric acid, and chlorine with hydrochloric acid. After being dried at 100° C. they consist of silver dioxide; 8·73 grains of the crystals dried at 100° C. yielded 7·58 grains of silver, leaving 1·15 grains to be accounted for. Considering the whole of this to be oxygen these numbers agree well with the formula $Ag_2\ O_2$; but as the crystals suffer decomposition at temperatures above 50° C. this cannot be considered to be their composition at the time of formation. 2·42 grains carefully dried at a temperature below 50° C. yielded 1·98 grains of metallic silver, leaving ·44 grains to be accounted for; and if we consider the whole of the gas evolved to be pure oxygen this approximates very closely to the formula $Ag_2\ O_3$, or a true peroxide of silver.

It is thus easy to conceive that if this represents the true constitution of these crystals they would be readily decomposed, even at moderate temperatures, evolving pure oxygen and leaving dioxide of silver. That this is not the case is evidenced by an analysis of the gas evolved on heating. This was effected by placing 7·1 grains of the crystals at the bottom of a porcelain crucible containing pure boiled water free from air, inverting over them a graduated tube, also containing pure water, and applying a gentle heat. When the temperature reached 45° C. the crystals commenced to be decomposed; at 50° C., all gas having been discharged, the apparatus was allowed to cool, after which 9·9 cubic centimetres of gas were found in the graduated tube, which by endiometric analysis was found to consist of 8·76 cubic centimetres of O, and 1·14 cubic centimetres of N, giving 88·48 per cent. of oxygen and 11·52 of nitrogen. Another determination of the gas from a fresh crop of crystals gave 88·1 per cent. of O.

These crystals, when heated in a hard glass tube, evolved the higher oxides of nitrogen. A direct experiment, made by heating 1·645 grains of crystals, and passing the evolved gas into water in which the amount of nitrous acid was estimated, gave—

| | |
|---|---|
| Silver | 1·325 |
| $N\ O_2$ | ·0345 |
| Oxygen, by loss | ·2855 |
| | 1·645 |

which would give an approximate formula of $8\ (Ag_2\ O_3)\ No_2$. These crystals, therefore, appear always to contain the higher oxides of nitrogen, and as their form is similar to that of nitrite of silver it appears not improbable that during the electrolysis of nitrate of silver the nitrite is first formed on the positive pole, and this being decomposed is changed into peroxide of silver, which, however, preserves the form of the nitrite and is always contaminated therewith. The relative amounts of silver and peroxide produced vary with the state of the solution. Two experiments gave—

| | | | |
|---|---|---|---|
| I. Silver | 18·4 | Peroxide | 10·7 |
| II. ,, | 17·7 | ,, | 12·27 |

The fifth method of producing nitrite of silver is by means of metals and other reducing agents placed in neutral solutions of the nitrate. The solution used contained ten per cent. of nitrate of silver. The metal having been placed in this the action was allowed to proceed till a fair amount of silver had been deposited. It was then decanted, the unreduced silver salts precipitated with ammonium chloride, and, after decanting from the argentic chloride formed, the presence of nitrous acid was detected by means of a slightly-acid solution of a mixture of potassium, iodide, and starch. Where nitrous acid had been produced it was rendered manifest by the immediate production of a deep blue colour; but where no nitrous acid had been formed the mixture remained perfectly colourless.

Experimenting in this manner it appeared that of the metals which produced a reducing action K, Na, Bi, Hg, As, and Th did not produce nitrites, whilst nitrous acid was found in greater or less quantity by the action of Fe, Ni, Co, Mg, Tu, Cu, Cb, Sn, and Sb. Now these metals divide themselves into two great groups of perissads and artiads—the latter metals so decomposing nitrate of silver as to produce nitrite; the former not doing so, but at once producing metallic silver without the intervention of any intermediate reducing action, thus indicating a radical difference in the action of these two classes of metals. The only metals whose action it is particularly desirable to notice, and which apparently depart from the true mode of action which might be expected from their atomicity, are mercury and antimony. The action of mercury, however, was such that a mercurous salt was produced, and, therefore, it actually took the place of a monotonic instead of a diatomic element.

With respect to antimony, it is possible that the nitrite was formed by means of the trace of iron the antimony contained, but this is scarcely admissible on account of the very minute quantity present; or it may be that antimony, although apparently pentatomic or inatomic, is in reality either tetratomic or hexatomic, following in this respect the example of iron. The two metals which produced the smallest amount of nitrite were nickel and tin; the formation of nitrous acid was, however, unmistakable in each case. The action of tin was also peculiar from producing a large quantity of a deep brownish-black powder.

With respect to the action of other reducing agents, gallic acid and phosphorous reduced the silver without production of nitrite, whilst suboxide of copper produced a decided amount.

It was shown by Dr. Gladstone, in 1872, that this latter substance reduces nitrate of silver in a peculiar physical manner, the silver being deposited in long filamentous threads; and it was also shown by the same chemist, in 1871, that the strength of the nitrate of silver solution modified to some extent the physical appearance of the reduced silver, when accomplished by means of copper; the weaker the solution the more thread-like being the silver.

With respect to the physical appearance of the silver deposit as seen through the microscope under powers varying from fifty to two hundred and fifty diameters, nickel and antimony produce threads of silver having a very near approach to the true filamentous condition; indeed, in the decomposition of a few cubic centimetres of solution by means of nickel in a tube, where the action takes some days to manifest itself to any extent, threads of metallic silver grew up from the bottom of the tube extending gradually to the surface and there spreading out in beautiful fern-like forms. Bismuth, on the other hand, reduced the silver in decidedly nodular crystals.

If, now, instead of using nitrate of silver for these reductions the nitrite be taken, then, with those substances which before reduced the silver in a filamentous form, that character becomes still more apparent; where before we had only thick threads and numerous branching spikelets approaching the filamentous character, we have now true filaments, and even, as in the case of bismuth, where before all was nodular and decidedly crystalline. Some filaments appear ending in tufts or spikelets, and mixed with many thicker threads springing across the field of view. Indeed, by examining the whole series of reductions from the case in which only black or nodular masses of silver are produced to that in which the metal is deposited in a truly filamentous form, it is impossible to draw a line between the one state and the other, the change being so gradual that no decided break occurs in the gradation. It thus becomes evident that nitrite of silver has some share in the formation of this filamentous character, crystals of nitrite being first formed, then these elongate by addition of other crystals, and are, at the same time, changed into thread-like forms of pure silver. Nitrate of silver itself can, indeed, by careful heating, be reduced to long threads of metallic silver.

With respect to the solubility of nitrite of silver in water: 105·79 grains of a saturated solution being taken, and evaporated to dryness at 100° C., ·1 grain of solid nitrite of silver remained, showing it to be soluble in about 1058 times its own weight of cold water. The great ease and purity with which, from this solution, it would be possible to prepare very dilute solutions of sodium or potassium nitrite of known strength would suggest the use of nitrite of silver in the preparation of standard comparison solutions to be used in the estimation of nitrites in potable waters. The salt may readily be dried at 100° C., but should be kept from the light. To test the action of heat upon it a tube with nitrite of silver, weighing together 106·93 grains, was heated for two hours at 100° C without loss of weight. During four hours more, the temperature being gradually increased to 115°, it also suffered no decomposition; the temperature was then kept at 145° C. for one hour, and now decomposition commenced, the tube and contents ultimately weighing 106·86 grains, having lost altogether ·07 grains, there having been ·63 grains in the tube originally! The nitrous acid lost was thus 37·2 per cent. of the total amount present.

## NEW SOLVENTS FOR THE PRECIOUS METALS.

Mr. T. Fairley, F.R.S.E., read a paper *On New Solvents for Gold, Silver, Platinum, &c., with Explanation of so-called Catalytic Action of these Metals and their Salts on Hydrogen Dioxide.* In this paper Mr. Fairley showed that many ordinary dilute acids with hydrogen dioxide, or oxygenerated water, can dissolve the precious metals gold, silver, and platinum. He also gave an interesting explanation of many chemical decompositions hitherto little understood, in which the element oxygen is given off, and confirming the theory of the compound nature of ordinary molecules of the elements.

Section D.—Biology.

*Thursday, August* 26, 1875.

## PHYSIOLOGICAL ACTION OF LIGHT.

The report of a committee appointed at the meeting at Bradford, in 1873, to investigate the physiological action of light was read by Dr. J. G. McKendrick. The results arrived at by the committee are as follow:—1. The impact of light on the eyes of mammalia, birds, reptiles, amphibians, fishes, and crustaceans produces a variation amounting to from three to ten per cent. of the normal electro-motive force existing between the surface of the cornea and the transverse section of the optic nerve. 2. This electrical variation may be traced into the brain. 3. Those rays that are regarded as most luminous produce the largest variation. 4. The electrical alteration is due to the action of light on the retinal structure itself, as it is independent of the anterior portion, eliminating, therefore, the natural supposition that the contraction of the iris might produce a similar result. It is possible by experiment to discover the physical expression of what is called in physiological language "fatigue." 5. The method employed in this research may be applied to

the investigation of the special organs of the other senses. One of the principal difficulties in arriving at the exact relation between the electrical variation and lights of different luminous and colour intensity was the continually diminishing sensibility of the retina to the stimulus, owing to the abnormal condition of the eye when separated from the body and deprived of blood. This difficulty was overcome by placing the animal under the influence of woorara or hydrochlorate of chinoline, both of which substances deprived the animal of sensation and motion. Thus experiments can be made upon the living eye without removing it from the body or in any way injuring the animal. It was found that on applying the electrodes of the galvanometer to the cornea and to the surface of the skin large deflections were obtained sensitive to light, and showing a remarkably constant alteration. In the early part of the investigation it was found that sometimes the initial effect of light was to produce an increase, and at other times a diminution, of the natural current circulating through the optical apparatus; but no explanation was then offered as to the cause of this apparent anomaly. It has now, however, been demonstrated by a large number of experiments that the variation is related to the primary direction of the current. The committee have also examined the action of polarised light and of the various coloured rays of the spectrum, with the result of showing that in all cases the yellow rays produce the greatest effect. They have also found that the extreme violet rays and the low red rays produce no alteration.

## MICROPHOTOGRAPHS.

Mr. H. B. Brady exhibited a series of microphotographs, chiefly from physiological and pathological preparations, taken by Mr. Hugh Bowman, of Newcastle. The apparatus was also shown and described. It consisted of a simple mirror of speculum metal, placed at an angle of forty-five degrees in front of the eyepiece of the microscope and directed downwards. The image was received upon a collodion plate set in the frame of a common photographic camera, and the photograph taken in the usual way. About eleven seconds was stated to be a sufficient exposure for the purpose.

The President (Professor Cleland), while admitting the utility of the invention, said that some difficulty would arise in its practical application, since in looking at a preparation it was often necessary to move the focus from point to point in order to obtain a complete examination.

### Section G.—Mechanical Science.

*Friday, August* 27, 1875.

## TOUGHENED GLASS.

Mr. J. D. Cogan introduced the subject of *Toughened Glass* to the section, his remarks being accompanied with numerous experiments with specimens of the glass. He let a weight fall upon a piece of common glass which it broke to fragments. He then let a larger weight fall a greater distance upon the toughened glass, which was not broken. He said the colour of the glass remained unaltered, and it bore a considerable blow. This he further illustrated by throwing a tumbler on the floor and violently striking several thin saucers of coloured glass on the table. When a piece of ordinary glass was broken they got sharp splinters, but if toughened glass was broken it flew to pieces. There was a very great resemblance between the fracture of the toughened glass and the fracture of the Rupert drop.

Mr. Hopkinson said he had taken a good deal of interest in the toughened glass. One point worth alluding to was the fact that the glass had a very marked effect on polarised light. This showed that the glass was in a state of strain. The outside section must set hard, and the interior must set, subsequently contracting in doing so, and so throwing the outer portion of the glass into a state of compression, and the interior between the two surfaces into a state of strain. He understood that sheets could not be cut with a diamond. It would be an interesting physical question to see whether it was possible to explain the resistance of glass by this state of strain, or whether they must look to some exceptional molecular condition of the glass as distinguished from the purely mechanical relation of the parts as regarded strain. He would like to ask what size of sheet glass had been annealed by the process. He had seen only small pieces.

Mr. F. J. Bramwell asked whether, after the process, it was possible to apply the grinding wheel for the cutting of glass. He would like to know what was the temperature of the glass and of the oleaginous mixture which was used, and whether the whole was allowed to get cool together.

Mr. A. Warren asked if, when the toughened glass was reduced to powder and examined with the microscope, any difference was found in the crystalline structure of the particles and of the ordinary glass.

Mr. Fairleigh said that he made experiments with this glass, and had adopted other substances besides oil. Cold mercury would answer the same purpose, although it required some care in regulating the heat of the glass. He had also prepared glass with fusible metal.

Mr. Cogan said that no large pieces had yet been made, and the only English gentlemen who had taken it up were Messrs. Powell, of White Friars. The increased strength of the glass simply arose from the condensation of the particles of glass. The glass could be cut just as ordinary glass and polished, whilst it retained its toughness. No annealing process was required for the glass, which could be brought out of the bath, cleaned, and sent at once into the market.

The Chairman (Mr. William Froude, C.E., F.R.S.) said that the subject was a most curious one, and contained very deep matter for speculation.

## OUR CLUB.

### No. X.—Good Folks.

There were many ministers scattered all over the country side where we were daily toiling to live, but the caste did not prove such a profitable speculation as I had anticipated. We got a fair return for our trouble in many cases, but in many others we had to contend with whim and prejudice, which ended in nothing. We got so bothered that we sometimes swore we would give up the church altogether as a source of profit, and turn our backs upon the cloth.

One day I called upon an *old* church minister, showed him my samples, and explained to him our progress and plans; but he cut me short by saying—"No, no! I don't allow anyone to take a picture of me."

I asked him why he had such an objection to have his picture taken.

"I will tell you the reason," he replied, snappishly. "I never go to Edinburgh, and in my quiet walk look into the shop windows where such things are exposed for sale, but I feel heartily ashamed of the motley mixture of good and bad, judge and criminal, minister and mountebank. A reverend friend of my own I saw hung between J. L. Toole and George Honey, Spurgeon hung alongside of the beautiful Mrs. Rousby, or the great Roger Tichborne smiling into the face of Principal Caird. I feel deeply grieved when I see these things, and I think they ought not to exist; hence I do what I can to obviate it as far as it lies in my power—so I will not have myself photographed."

"There is another side to the question," I remarked, quietly. "Suppose, now, some person hears Principal Caird preach and is much delighted, and, wishing to have the portrait of the man who has imparted so much pleasure to him, he purchases it to place in his album. Is there anything wrong in this? Do you think it unreasonable?"

"Certainly not."

"Well, another man has seen J. L. Toole, has enjoyed his performance of, say, *Caleb Plummer*, and he wishes to have his portrait to put"——

"Stay, sir, stay! Would you put the two things in the same light?"

"Why not? they are both clever men."

"I will not listen to you, sir; nor do I mean to have my portrait taken. Good morning!" In his heat he strode away.

In giving you these notes it is not to show the conduct we universally met with, but only, should you ever think of going out to make a country excursion like ours, to give you an idea of some of the disagreeable elements you may have to contend with.

I called on an U. P. minister, who informed me that, personally, he had no objections to sit, but that he would not have his portrait hawked about among his congregation, as he considered it a vanity and an exalting of the creature.

"Oh! if you do not allow us to sell it we might as well not take it at all," I remarked.

"No; it would not be much use," he mused.

"And yet it might be of some use," I replied, feeling annoyed at my failure. "We keep all our negatives, and they come in very useful for enlargements in case of death; they are both handy and profitable then. Will you give us a sitting?"

"No, sir."

I met an advanced liberal in the shape of a Free Church minister. He had been photographed everywhere and in every style—from the four-headed cameos (which remind one of sheep's heads hanging in a butcher's shop) to the really beautiful imperial picture.

"So," he said with a smile, "having been at the best men you can do no more with me, I fancy."

We fancied we could, but he would not give us a chance.

I am free to confess that I would not have you pin your chance of success upon the church. Make it an established rule to take all out of it that comes easily, but be not too eager to hunt after it; there is no fortune in it, believe me. Mark Oute.

## PHOTOGRAPHY IN COURT.

### A STUDIO UPON WHEELS.

A case of great importance to photographers, inasmuch as it involves a conflict with one of their "natural enemies"—the district surveyor—was heard at the Canterbury Police Court, on Thursday, the 27th ult., before Mr. J. Aris and Mr. J. G. Drury.

It was a prosecution by the Town Council instituted against Mr. Frederick William Nichols, photographer, of 18, St. George's-terrace, who appeared in answer to an adjourned summons, for that he, being the occupier of the house above named, had (we quote from the *Kent Herald)* erected a new building, the external and side walls of which were not constructed of brick, stone, or other hard and incombustible

substances, and without the permission of the Urban Sanitary Authority of the city, contrary to the byelaws.

Mr. R. W. Flint, the Town Clerk, appeared on behalf of the Council to prosecute; Mr. Minter defended.

Mr. Flint said it would be as well that the case should be gone into *de novo*, especially as the bench was differently constituted from that of the last hearing, and also because he was informed that the defendant had himself written to each of the magistrates upon the case.

Mr. Aris said he had received a letter of that kind, but he should disregard it.

Mr. Flint proceeded to say that the defendant was a photographer, who had recently taken up his residence in Canterbury, and had commenced the erection of a wooden building without the knowledge of the Sanitary Authority, and without sending plans to them. The surveyor's attention had been called to the fact that the building was being constructed of combustible materials, and therefore in contravention of the byelaws. Mr. Hall went to the defendant's house, and told him that he had better not go on with the building. In answer to that Mr. Nichols sent in an application to the surveyor, asking the General Purposes Committee to allow him to erect a temporary portable studio at the back of his premises, but the Committee decided that they could not sanction it. Immediately after that a letter was written from the Town Clerk's office calling on the defendant not to proceed further with the building. There were two byelaws, Mr. Flint said, which the defendant had broken—the first, that he had neglected to send in plans to the Surveyor, and in his letter he had called the defendant's attention to the fact that he had already rendered himself liable to be proceeded against, but that as he had erred in ignorance the Council had decided not to take proceedings upon that byelaw. At a later meeting the Council decided that the defendant must enter into an agreement to remove the building before Michaelmas, and under this understanding they agreed to stay proceedings, but expressly stating that the building was distinctly illegal. The agreement was prepared, and was read over to Mr. Nichols, who refused to sign it. That refusal was reported to the Council, and proceedings were ordered to be taken if the defendant did not remove the building, or undertake to remove it before October. The byelaw under which these proceedings were taken was byelaw 7, which enacted that the external and party walls of any building should not be constructed of combustible material, unless the Urban Sanitary Authority should otherwise allow, on the ground that they were not calculated to promote the spread of fire. The defendant had also contravened the 29th byelaw of the Sanitary Authority by not sending in a notice a fortnight previous to the commencement of building, nor any plans of the proposed erection. It had been said—and he would anticipate the defence—that the building in question did not come within the meaning of the act, because it did not belong and was not fixed in the freehold; and it was undoubtedly true that the building had been placed on wheels, but these wheels were of no use for moving the building, as it was surrounded by four walls, and could not be removed without breaking some of these down. The magistrates ought rather to consider the intention which the defendant had in erecting it, for there was no doubt that in these days the largest buildings could be removed on wheels by mechanical contrivances. To put this more clearly before the bench Mr. Flint quoted the case heard in the Court of Common Pleas of Stevens *v.* Gourley. This was an action brought under the 12th section of the Metropolitan Building Act, which provided against the erection of combustible buildings similar to the one concerning which the present proceedings were brought. The house or shop which it was sought to remove was built entirely of wood, and rested on timber foundations laid upon the surface of the ground. In giving a judgment for the plaintiff Chief Justice Erle, among other remarks, said—"As to the argument that had been raised as to whether this was a 'building' within the meaning of the act, the building was to be composed of wooden joists laid on the ground, with wood added until the shop was made. He was of opinion that a house constructed of wood, although it might not be resting on masonry let into the ground by way of a foundation, was, when he considered the combustible materials of which it was formed, within the mischief provided against by that act. It had also been argued," the Chief Justice continued, "that, because that structure was movable and capable of being moved in its entirety, it was therefore in the nature of a box or small article, and could not with any propriety of language be considered a house. But the answer to that was—that though by the application of mechanical power a large structure might be removed in its entirety that did not prevent it from being a building under the act." In this decision Judges Williams and Crowder concurred. Judge Byles also agreed, remarking that without attempting to define the word "building," "he thought it was usually understood to be some structure or erection of considerable size, intended to be permanent, or at least to last for some time, whether let into the ground or not." The building under consideration was, in his opinion, clearly a building in the ordinary sense of the word. Then what was the object of that act of parliament? One of the objects was to prevent the erection of combustible structures, and therefore, looking at the ordinary meaning of the word and the object of the act, there could not, he thought, be a doubt but that that was a building within the meaning of the act. Those opinions of the Judges, Mr. Flint argued, went to show that the word "building" was intended to include structures that rested on the land, and was not confined to those whose foundations were built into the ground.

Mr. Flint was then sworn, and stated that the facts he had spoken to in his opening remarks were true, and the minutes and letters quoted correct.

Mr. Minter, to shorten the proceedings, offered to admit these.

Mr. Flint then put in a printed copy of the byelaws, which were legalised by the Local Government Act.

The evidence of Mr. Hall, the city surveyor, was then read, as taken at the first hearing. He said he had examined the building which was the subject of these proceedings. It was built entirely of wood. He considered it dangerous. It was standing when he last saw it, and he had received several complaints about it.

Examined by Mr. Flint.—The size of the yard was thirty feet seven inches by thirteen feet ten inches, and the size of the structure nineteen feet ten inches by nine feet four inches. The property was enclosed by walls, and there was no means of getting the building out of the premises, not even if the boundary walls of the premises were pulled down. The joists or sleepers on which it was built were laid flat upon the ground. When he first saw it there were no wheels upon the building, but since then wheels had been attached. He considered they were very little use indeed for the removal of the building, for it was made in two parts, and two wheels were on one part and two wheels on the other. The wheels were fourteen inches in diameter. They were new, but the body of the building was of old material.

Cross-examined by Mr. Minter.—The building had no connection with the walls of the premises on any side. He would undertake to say certainly that the building was not a carriage. It was built of weather boarding. He knew what weather boards were, and these were a sort of weather boarding. The building was fastened together by ordinary cast-iron buttons, and in other parts by hinges. It could not be taken down, in his opinion, in an hour and a-half. One of the movable panels of the building was shown to the witness, and he said it was made of weather boarding.

Mr. Minter.—Do you mean to say, as architect of this city, you required plans to be sent in of such a structure as this?

Mr. Flint.—We must abide by the law.

In reply to Mr. Drury, Mr. Hall said the roof was partly of wood and partly of glass.

This was the case for the prosecution.

Mr. Minter, in reply, argued that this was not a building within the meaning of the act of parliament. He should have liked the bench themselves to have gone and seen the structure in question—a course that would have been more satisfactory than to take the evidence of the Surveyor. The structure in question was merely one of the ordinary travelling photographic carriages which might be seen going about from place to place. If they were to begin by saying that it was a building within the meaning of the act they would then have to proceed against all the coach-builders of the city, and to require them to send in plans of every new carriage they built. It was perfectly true that the first time the Surveyor saw the structure it was not on wheels; but that was because the old ones were worn out and the defendant had ordered a new under-carriage to be made. He called

Henry Solly, a coachbuilder of Canterbury, who stated that he should consider the structure in question a carriage, and he could take it to pieces in an hour and a-half.

This was the complete case, and the magistrates immediately decided in favour of the defendant, the Chairman saying they "had given great consideration to the case, and from what appeared before them in evidence they were of opinion that the structure was not such a 'new building' as to come within the byelaws of the Sanitary Authority."

Mr. Flint.—I shall, then, have to ask the magistrates for a case on the point of law.

Mr. Aris.—It is a question of fact, and not of law.

Mr. Flint.—It is a broad question, and I shall advise the Council to appeal against the decision.

# Correspondence.

## PRESERVING SENSITIVE PAPER.

*To the* EDITORS.

GENTLEMEN,—I observe in your last number, among the "Answers to Correspondents," a reply to a correspondent signing himself "M." I have tried the formula given in the ALMANAC, and find the following quite as good, and giving much less trouble:—

I prepare a number of sheets of cheap blotting-paper by immersing them in a solution of bicarbonate of soda and letting them dry. These may be used over and over again. I then sensitise as much paper as I am likely to want during the next three or four weeks, interleave it with the blotting-paper, and place the whole under a weight.

I have used this "dodge" for more than a year, and have never had a print spoilt from the paper having become discoloured. Many amateurs would prefer this method to one involving the mess of a double bath. I may add that with this paper I use the ordinary acetate toning bath.—I am, yours, &c., H. S. W.

*August* 31, 1875.

## SWEET SPIRITS OF NITRE.

*To the* EDITORS.

GENTLEMEN,—In your last week's Journal Dr. Nicol suggests that photographers can use, in place of methylal, with equal advantage, the sweet spirits of nitre to be found on the shelves of all country druggists, and further remarks that it would be all the better for being made from methylated spirit.

To prevent disappointment I beg to remind your readers generally that the manufacture and sale of the methyl compound is strictly forbidden by the government. A fine of £100 can be enforced for every parcel found on the premises.—I am, yours, &c.,

F. W. HART, F.C.S.

8, *Kingsland-green, London, August* 30, 1875.

## LIGHTING THE STUDIO.

*To the* EDITORS.

GENTLEMEN,—With considerable interest I read the article in your last, by Mr. G. W. Webster, on the principle of lighting studios similar to that described by you as constituting the Vanderweyde system, and with your correspondent I say "*cui bono.*"

So far as the experience of one who has constructed a studio on principles similar to those noted in your description of the "Vanderweyde," I certainly think the gain in light is small, while the difficulty of construction and the greater ground space required far more than counterbalance the gain.—I am, yours, &c., JOHN ROBINSON.

*Dublin, August* 30, 1875.

## BURNISHERS.

*To the* EDITORS.

GENTLEMEN,—As far as I can make out from the advertisements and the descriptions that have appeared in your Journal—for I have not seen either of the machines—both the "Weston rotary" and "Entrekin oscillating" burnishers produce their planishing effects by drawing the mounted photograph over a polished and heated steel surface. Now, from stubborn facts that have come under my notice, I am induced to believe that the frequent application of heat to steel has the effect of softening and eventually of reducing it to a condition not differing much from ordinary malleable iron.

I am at present using a rolling-press provided with a steel plate heated by gas jets placed underneath, which plate at first presented a highly-polished and hard surface, but after a time it became scratched and I had to have it repolished. This operation has had to be repeated several times, owing to its now being so easily marked. The person who polished it—a man constantly occupied in polishing steel work—informed me that the plate was very soft and unfit for the work it was intended.

Some time ago, when the photographic business was slack, I was doctoring an old timepiece which had become refractory and refused to "tick," when, on trying to cut a small steel bar supporting the pendulum, I found that the file would have nothing to do with it, it was too hard for its teeth. Subsequently, having occasion to heat it in a gas flame, it was so softened that the file would cut it readily. Another time I purchased a dozen best ivory-handled table knives, to clean the blades of which after use, my housekeeper—who had a will of her own—would insist on dipping them into a saucepan of boiling water instead of merely wiping them with a cloth. It was soon "all up" with my knives, and they would now require heating in order to properly cut butter.

Cannot our burnishing-machine makers substitute something less liable than steel to change its properties?—I am, yours, &c.,

*August* 30, 1875. ONE IN WANT OF A POLISHER.

[It is quite true, as our correspondent observes, that ordinary hardened steel will eventually be softened by the continued application of heat; but it may not be generally known that there are metals or, more correctly speaking, alloys which are not only exceedingly hard, but possess the valuable property of not having their hardness affected by heat.—EDS.]

## EXCHANGE COLUMN.



## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

J. S. T.—Such an interview was quite impossible owing to our absence from London.

F. JAMES D.—We have communicated with the gentleman named in your letter, who informs us that the matter has been attended to.

W. B. (Salford).—We understand that the formula will be published in about three or four months, when a communication on the subject will be made to the London Photographic Society.

ROBERT S. BAXTER.—We regret our inability to give you at present the best proportions, but these can easily be discovered by two or three trials.

THE LAMBERTYPE PROCESS.—Mr. D. Winstanley, referring to some of the allegations made during the recent controversy, writes expressing his dissatisfaction that we allowed Mr. Brothers to make a statement relative to the sale of secret processes without allowing him (Mr. Winstanley) space to contradict such statement. Controversies must end somewhere; and our correspondent will have seen that in the letter of M. Lambert, in our last issue, was published all the explanation or contradiction necessary; and that, taken in connection with a further explanation by Mr. Brothers in this column, leaves now nothing more to be said.

H. F.—Being from home at the time we write this we cannot give you an exact reference; but in our last volume, and *apropos* of a description of a new printing process by Mr. Willis, we gave in one or more articles a *résumé* of printing processes which depend upon the salts of iron. To this description we now refer you, as you will there find several formulæ for printing photographs in the blue colour desired. You may also try the following:—Wash plain paper with a solution of ammonio-oxalate of iron, and, when dry, expose it under the negative, after which apply, either by a soft sponge, a a pad of cotton-wool, or by flotation, a solution of ferrid-cyanide of potassium (red prussiate of potash). The print is fixed by washing in plain water.

BLISTERING OF THE GELATINE FILM.—Mr. Charles Esden is troubled with the blistering of the film in the gelatino-bromide process. We give an extract from his letter in the hope that some of our correspondents who have had experience in this kind of defect may suggest a remedy. He says:—"In my former letter I alluded to the gelatine film as 'dissolving;' I should have more correctly described matters if I had said it swelled, puckered up, and left the plate as a kind of half-dissolved jelly. Neither solarising the edges nor mixing the developer with alcohol mended matters. I also tried flooding the plate with tannin before development, but this was useless. When the pictures first developed they were all that could be wished; and if you or some correspondent can tell me how to prevent the film going down the sink I shall be very much obliged. Will some successful worker say where he got his gelatine?"

SECRET PROCESSES.—Mr. Brothers, writing in reply to the charge made against him of being a vendor of secret processes, explains to us that "there is just a shade of truth in what M. Lambert says about a certain secret process having been sold by me on December 12, 1872. That sale was effected while I believed in the genuineness of the thing sold; but when I found I had been deceived in the matter I informed the party to whom the sale had been made that his money would be returned, and he holds my letter authorising him to deduct the amount from money due to me from him. I consider this equal to never having sold; but, to be quite candid, I had forgotten the circumstance while writing. Respecting the Ferranti-Turner process, I am not an agent. I am sole licensee for Manchester and neighbourhood, and this is quite different from an agency. There can be no 'rivalry' between things that are totally different."——The explanation here given by Mr. Brothers must be considered final.

A. G. DE TEJADA.—1. A very good account of the daguerreotype process will be found in any of the editions of Hunt's *Treatise on Photography.*—2. After the plate has been polished it is exposed to the fumes of iodine until it assumes a rich yellow colour; it is then exposed to the fumes of bromine until of a rose-pink colour, when it must be again returned to the iodine until it is blue. At this stage it is very sensitive, and is ready for exposure. The bromine must not be used in its pure condition, but must either be very much diluted (till of a deep sherry colour) with water, or a few drops of it shaken up with dry lime, which latter will thus become of a reddish-yellow colour. After exposure in the camera the plate is to be exposed to the fumes that arise from mercury which has been made warm, by which the picture is developed. It then receives an application of a solution of hyposulphite of soda, and, after being gilded—an operation that we cannot describe in a few words—and washed the daguerreotype is finished.

GALLO-FERRIC DEVELOPER.—A Dum-Dum (Calcutta) correspondent, "Symmetrical Alligator," writing on the subject of a developer composed of a mixture of pyrogallic acid and protosulphate of iron, says:—"I am interested in knowing how to mix pyrogallic acid and iron, and I fancy there are others would be glad to get the same information. In the Journal of the 9th October, 1874, I see that Mr. C. L. Law wrote to you (page 490), and that in your reply you mentioned that nitric acid must be added to the mixture of pyro. and iron. Would such a developer do for instantaneous work and for the development of landscape negatives generally? You will very greatly oblige me by giving the formula as fully as possible—particularly mentioning whether the mixed solution will keep, or whether the pyro and iron should be mixed, and the nitric acid added only just at the moment of using the developer, and also whether such a developer can be used with the ordinary bromo-iodised collodions in the market?" We reply:—The developer in question may very easily be made by mixing together equal parts of a three-grain solution of pyrogallic acid and a twenty-grain solution of protosulphate of iron. The mixture will assume an inky-black appearance. Nitric acid is then added, drop by drop, until the solution becomes clear. A little acetic acid is now added, after which the developer is ready for use. It keeps well for, at least, some weeks; and a peculiarity we have noticed when using it is that it may be allowed to remain on the plate for a considerable period of time without producing fog. Should it not act with sufficient rapidity increase the strength of the iron. It works with ordinary commercial collodion.

### CONTENTS

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## THE DEVELOPMENT OF DRY PLATES BY MEANS OF AMMONIA VAPOUR.

A few weeks ago we made slight mention of the revival by M. Plucker of the development of dry plates by means of ammonia vapour, since which time we have been engaged in a series of practical tests of the value of that method.

As we have before remarked, the principle is by no means new, having been worked many years since by various persons, notably by Mr. H. T. Anthony, in America, and the late Mr. John Glover, in this country. Success, however, does not appear to have attended their efforts, as the vapour system was very soon relinquished in favour of aqueous solutions of ammonia or other alkali. The difficulties which have heretofore stood in the way of the successful employment of ammonia vapour appear to have consisted chiefly in the want of restraining power when a moistened film was exposed to its influence; while the action upon a dry film was insufficient to compass the end in view.

M. Plucker has, however, suggested a compromise, which depends upon the slight softening effect produced by the moisture of the breath; and by breathing upon the sensitive film it is brought within reach of the vapour without placing the action beyond control. We have followed the instructions given by M. Plucker himself, and have, in addition, made variations of our own with the view of ascertaining if the vapour method be likely to offer any practical advantages, under particular circumstances, over the alkaline development in ordinary use, and also to test the stability of the faint image produced previous to intensification.

As to the possibility of successfully developing an image by M. Plucker's method we had not the least doubt when we wrote previously, having already satisfied ourselves upon that point by actual trial; but we had doubts of the keeping qualities of the semi-developed plates after the film had undergone the moistening effect of the breath. We are now able to speak favourably upon that point to the extent of, at anyrate, three weeks—a period which, we believe, will be found generally sufficient under circumstances where the vapour method promises to be of the greatest utility, namely, for securing the image *en voyage*.

It can carcely be considered as an improvement upon the usual method employed in a properly-appointed developing-room, and with all the necessary equipments at hand; but provided that equal results may be produced, which we have already stated to be the case, it affords a ready means to the travelling photographer of effecting the development of his plates *en route* without the trouble and nuisance of bottles and solutions and the accidents arising therefrom in a strange place. It also enables him under the same circumstances to verify his exposures each evening where it is not thought desirable to develope the whole of the plates exposed, and in the case of any particular subject to secure with certainty a satisfactory result before leaving the neighbourhood. These are matters worth the serious consideration of dry-plate amateur photographers, whose object is to obtain the best possible results with the smallest amount of trouble and expense, and to travel with the minimum of encumbrances in the shape of unnecessary apparatus. How such an object may be attained the results of our experiments will show.

In the first place, much depends upon the manner in which the plates have been prepared—whether by the bath or from an emulsion, washed or otherwise—and also upon the nature of the preservative, if any. As we pointed out, the plates employed by M. Plucker are prepared with the bath and are subsequently treated with a preservative containing tannin—two features in their preparation which render the films peculiarly suited to this form of development. But a plate prepared by the collodio-bromide process with excess of soluble bromide refuses to act in the same manner—that is, to give an image under the action of ammonia alone; and with some samples of pyroxyline this is the case even if a tannin preservative be used.

With plates prepared from an emulsion containing free silver, and made from a suitable pyroxyline, either pyro. or ammonia alone, especially the former, will be found to bring out the picture without difficulty; but when the cotton happens to be unsuited to the purpose the presence of a reducing agent—such as tannin, gallic or pyrogallic acid—is necessary in addition to the ammonia.

In the case of bath plates, even though no such reducing agent be present in the organifier, the effect of the excess of silver present during the formation of the sensitive surface is sufficient to produce the desired result, though the rapidity and quality of the development are improved by the employment of a suitable developer. The same remarks also apply with, perhaps, greater force to emulsion plates prepared in the old style with excess of silver.

Washed emulsions made according to Mr. M. Carey Lea's plan, by treating the semi-desiccated pellicle with an organifier in the presence of excess of silver previous to washing, produce films which give the most satisfactory results without further treatment; but with the earlier form of pellicle emulsion prepared with excess of bromide it is absolutely necessary to carry into effect the recommendation of the addition of a small quantity of tannin or other substance to the redissolved pellicle.

For this purpose we prefer pyrogallic acid or, better still, both pyro. and gallic acid—half-a-grain of pyro. alone, or the same quantity together with one grain of gallic acid, to each ounce. Tannin or gallic acid may be used alone or in combination; but the pyro. renders the development quicker and confers a vigour on the image rarely found in its absence. The gallic acid is used in conjunction with pyro. if a soft picture full of detail be required, or if the subject should contain violent contrasts. In adding pyrogallic acid to the emulsion (and, to a smaller extent, gallic acid and tannin) it is important that the latter should be quite neutral. On no account should it be alkaline, or the suspended bromide will be rapidly discoloured by partial reduction.

Our experiments were performed entirely with emulsions of various sorts, the best result being produced by a washed emulsion prepared with excess of soluble bromide, and organified after re-solution with pyrogallic and gallic acids. Next in order came the washed bromide emulsion prepared with excess of silver according to Mr. Lea's plan, and treated with an organifier containing the same substances. The only fault in this case was a slight tendency to veil in the shadows,

owing, doubtless, to the entire absence of soluble bromide. This veiling we were able to mitigate or altogether prevent by exposing the film to the vapour from a *very weak* solution of bromine in alcohol, about five drops to the ounce; but the effect was only produced at the expense of a very great diminution in sensitiveness.

The chloriodo-bromide process appears not to work so favourably with this mode of development, the vapour being apparently unable to penetrate into the film sufficiently to produce any effect on the iodide, while our previous remarks on fogging are equally applicable to this case. The older forms of emulsion, with either silver or bromide in excess, develope well, but are not so sensitive as the others we have mentioned, besides the extra amount of trouble required in preparing the plates.

Our *modus operandi* is extremely simple. At the bottom of a shallow box we place a sheet of glass, upon which are laid two or three thicknesses of white blotting-paper. The blotting-paper is saturated with ammonia (equal parts of the strong liquor ammonia and water), and two strips of wood at least an inch thick are placed at such a distance apart that the plate will rest upon them by the edges, with the film exposed to the vapour. This constitutes the developing-box, which may be improvised in a few minutes by any amateur. The strength of the ammonia given is that which has proved most satisfactory in our own instance; but it may be varied to a very great extent to suit particular circumstances—indeed, M. Plucker's directions are to use it undiluted.

Before development the film is to be carefully dusted with a light brush; then, having adjusted the wooden supports in the developing-box to the proper distance, breathe gently three or four times upon the film, moving the plate during the exhalation, so as to ensure the whole surface being equally treated. It is then placed, face downwards, upon the supports and the lid of the box closed. After the lapse of about thirty seconds, more or less according to the nature of the plate and the exposure, the lid may be raised for the purpose of noting the progress of the development. If the sky and high lights be faintly visible the exposure has been sufficient; the lid may be closed again and the plate left until all the details are out. This will frequently be found very difficult to judge, as the image formed by the vapour is so faint and delicate that the most careful inspection is necessary to distinguish the finer details. If after reaching a certain stage the development should appear to stop take out the plate and repeat the operation of breathing upon it. If this should not prove sufficient a few drops of strong ammonia should be sprinkled upon the blotting-paper, taking care to distribute it pretty evenly over the whole surface. If it be found impossible to get out the details by any of these means do not reject the plate as useless, for, unless it be very much under-exposed, the aqueous developer, if properly used, may yet make a negative of it.

A very convenient form of developing-box is one with a glass lid or a piece of glass let into it, or even with a sheet of glass laid over the top. This allows the development to be watched from the commencement and every change noted, enabling the operator to act immediately upon the first sign of under- or over-exposure.

If upon placing the plate in the developing chamber the sky should make its appearance at once, or the whole of the film should change colour very slightly, remove it at once. If the plate appear to be clean and merely over-exposed it will generally be found sufficient to allow the moisture derived from the breath to partially evaporate and to weaken the ammonia vapour. If a tendency to veil or fog be noticeable it will be necessary to treat the film with the bromine vapour. This is conveniently effected by coating a clean glass plate, the same size as the one under development, with the alcoholic solution of bromine in the same manner as with collodion, and when the surplus has been poured away lay it upon the table, holding the exposed film over it at a short distance for about thirty seconds, having previously breathed upon it as at the commencement of the development. It is then returned to the developing-box.

Much may be thus done in one way or another towards remedying the defects of under- or over-exposure; but we need scarcely say the best result goes with a correct exposure. There are many subjects, however, which, combining in the one picture the most violent contrasts of light and shade, cannot be satisfactorily rendered, no matter what the exposure may be, without recourse to some "dodge."

One of the dodges resorted to for this purpose is "local development"—an expedient admirably adapted to the method of development in question. Suppose, for instance, on developing a negative the greater portion of it is "out" in all its details, and further action of the ammonia will, or is likely to, spoil it, but the remaining portion, consisting, say of foliage in deep shadow, shows not the slightest trace of detail—in this state the negative may be said to be worthless; but if it be set aside until the moisture shall have evaporated, or be dried by artificial heat, it is ready for further treatment. In the perfectly dry state the ammonia vapour will have little or no effect upon the film; if, therefore, by breathing gently through a glass or paper tube upon the backward portion the latter is brought within the power of the developer, while the high lights remain insensible to the vapour the development may be "dodged" in such a manner as to produce many useful as well as pleasing effects.

The question as to how far hygroscopic substances may be permitted in the film has received some amount of attention. It is to be borne in mind that for plates required to be kept for some time before exposure, especially in the moist atmosphere of North Wales or other rainy countries, it is not advisable to make such addition; but where the plates are to be kept only for a day or two we have found the addition of a minute quantity of glycerine to be beneficial in rendering the development more regular and easy. We make a solution of one part of glycerine in seven parts of alcohol, of which we add from three to five drops to each ounce of emulsion.

As to the keeping qualities of the plates, both before and after the preliminary development, we can speak, so far as our experience goes, very highly. The stability of the latent image previous to the vapour development we find to differ in no respect from the ordinary practice. This was to be expected; but were it otherwise it would be a matter of little importance, as the chief value of the vapour system lies in its use, while travelling, in developing each day's plates at once. The delicate preliminary image we find to be as good at the end of three weeks and to intensify as readily as if that operation were performed immediately after development. The redevelopment may be performed by means of either alkaline pyro. or silver as the appearance of the image may seem to dictate. If the former method be followed the full quantity of restraining bromide should be used, in connection with a tolerably strong dose of alkali. We prefer to use silver in those cases when the image possesses all the detail required and where any further continuance of the real developing action would be unnecessary or injurious.

We have made one or two rough attempts at the development of a number of plates in one operation, and while they remain in the plate-box or in a rack; but further experiment is necessary to render the plan practicable. We have, however, given sufficient of the details of the vapour system to enable our readers to work it for themselves.

## POLARISED LIGHT: ITS NATURE AND USES.

### IN THREE CHAPTERS.—CHAPTER I.

While Mr. W. Spottiswoode, F.R.S., on the evening of Friday, the 27th ult., was proceeding with his lecture on the *Colours of Polarised Light* before the British Association we became impressed with the conviction that the subject was one that might fitly be presented to our readers, although from a somewhat different point of view. Availing ourselves, therefore, of notes of a more comprehensive character than those published last week, made during the lecture, and also of the results of experience acquired during experiments of our own, we now apply ourselves to the task of treating the subject of polarised light in a manner which, we hope, will be understood by even the least experienced reader.

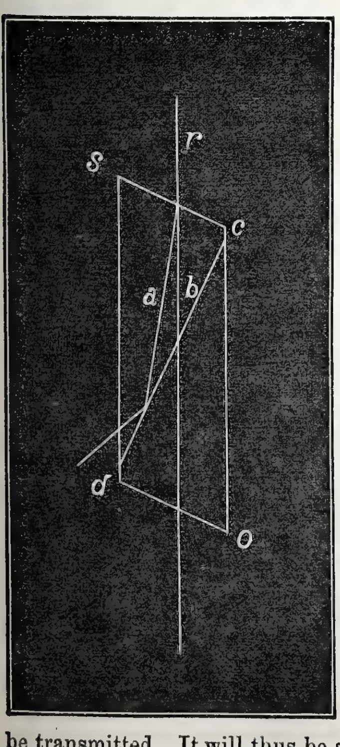
As a basis for our observations we give the poetical description of the wave theory of light adopted by the lecturer on the occasion referred to. If, said he, we figure to ourselves the universe as filled with an elastic fluid, to the rhythm of whose movements some substances are imperturbably deaf, while others respond like a musical string to sounds; if, further, we suppose the waves of this

fluid to be traversing space in various directions, sometimes exalting one another, sometimes even obliterating one another, and themselves modified by the matter which they pervade; and, lastly, if to the impulse of these waves we attribute the sensation commonly called "light;" then, in such an hypothesis, however complex, we shall have imagined nothing more than that for which there is abundant evidence in experimental fact.

A few years ago, in some articles on the polarisation of light, we described light as being the continuous undulatory condition of the atmosphere, each ray of light being represented by an undulating line with another similar line running at right angles, so that if an end view of a ray could be obtained it might be represented by a vertical line crossed by a horizontal one of the same length. If by any means one of these undulating lines—say that which vibrates or undulates in a horizontal direction—be removed, leaving only that which undulates in a vertical direction, then the ray is said to be polarised.

At this stage the question fitly arises—By what means may a ray of light be polarised? We reply: by reflection and transmission. But previous to pursuing this theme let us, first of all, speak of a double-refracting crystal, and show its influence upon a ray. Anyone who has looked at an object through a piece of Iceland spar (crystallised carbonate of lime) must have observed the property it possesses of showing that object in duplicate—two images being seen instead of one. This crystal is a favourite "show" object in the windows of the establishments of opticians and mineralogists, where a block of it is often to be seen with a sheet of paper placed behind, one or two wafers and a cross being displayed on the paper. These are all seen doubled, one complete set of the objects being at a slight distance from the other. When light enters certain bodies the ray becomes split up or divided into two. One of these is termed the "ordinary," and the other the "extraordinary," ray, and when either of these rays is got rid of that which remains is a polarised ray of light.

But how can either of these be dismissed? This leads us to allude to that admirable invention, the Nicol prism—an instrument which now takes an important part in almost every experiment and demonstration with polarised light. The name is given in honour of the inventor—a gentleman now long deceased—who conceived the happy idea of dividing and re-cementing a rhomb of calcite or Iceland spar in such a manner as to throw off to one side one of the two divided rays. To show the construction of a Nicol's prism, and, at the same time, explain the way in which light is polarised by it, we give the annexed diagram, which represents (*s*, *c*, *d*, *o*) a block of spar. This has been cut asunder by means of a saw into two triangular pieces or prisms, which are joined together by Canadian balsam in the line extending from *c* to *d*. A rhomb of spar thus prepared constitutes a Nicol's prism. The sides are usually kept rough and covered with black varnish, the ends alone reuiri ng to be polished.




An ordinary ray of light, *r*, is represented as passing into the prism at the upper end, but it no sooner enters than it is split up or divided into the two rays *a* and *b*. The ray *a*, it will be seen, falls upon the film of Canadian balsam at such an acute angle that the balsam—which has a refractive index intermediate between that of the spar for the ordinary and extraordinary rays —acts the part of a totally reflecting mirror, and sends the ordinary ray *a* out through the side of the prism, leaving the extraordinary ray *b* to be transmitted. It will thus be seen that the ray *r*, which enters one end of the prism as ordinary light, emerges from the other end as a polarised ray.

This method of polarising light is that which is exclusively employed with the microscope. It would also be exclusively employed in connection with the lantern, and every other mode by which the phenomena of polarised light is exhibited to large audiences, were it not for the great expense attendant upon the production of large prisms. In addition to the expense there is another difficulty: it is difficult to get a prism which will transmit rays emerging at a wide angle. Both these drawbacks may be surmounted by the use of a Nicol prism of a character similar to the one just described, although of a totally different construction. It was invented by M. Jamin, a French physicist, about six years ago, but it seems to be still nearly unknown on this side of the channel. A round tubular box is made of brass or other material, and is blackened inside. It has a glass bottom firmly cemented in, so as to prevent the escape of bisulphide of carbon, with which it is filled. Previous to fastening on the glass lid a thin, polished plate of Iceland spar is let down into the box and firmly secured, so that it may occupy a precisely similar position to the layer of Canada balsam in the ordinary Nicol's prism. It is desirable that large prisms of this kind should be constructed; for, while we understand that they act well, there can be no doubt whatever of their production at a cost immeasurably less than prisms of solid spar, which, when free from veins and defects, are extremely costly, as we found a few days since when ascertaining the price of a rhomb of spar we were desirous of possessing. In our next number we shall resume the subject.

## SERUM OF MILK AS A PRESERVATIVE.

In the early days of dry-plate photography, and before it was discovered that almost any soluble organic matter might be used as a preservative, dry-plate workers were confined to but three or four substances. Gradually, however, article after article was added to the list, and it was amusing to witness the zeal with which each discoverer supported the claims of his pet preservative, or, as he preferred to designate it, his process, the rather ambitious title being generally preceded by the name of the article used, although occasionally the proposer was less modest and attached his own name to it instead. All this is much altered now, but we are not quite sure that the change is altogether for the better.

Although it may be quite true that almost any soluble organic matter will act as a preservative, it is equally true that varying kinds of organic matter behave very differently when used for that purpose. We have reason to believe that this fact is to a great extent lost sight of by large numbers of those who now give their attention to dry-plate work. They seem to have the idea that because any substance will do they ought to be satisfied with what they have, and so neglect, or do not care to take the trouble to try, anything that may from time to time be brought under their notice. Possibly another cause of this disinclination to try novelties may be found in the fact that an inexperienced worker may, by a lucky accident, produce a first-rate negative. The preservative, especially if it be the outcome of his own brain, gets the credit, and is at once published as the desideratum so long looked for—the *beau ideal* of preservatives—by which success is to be secured and failure a thing of the past. The "lucky accident" does not happen with those who are induced to give the new substance a trial, and so they are in future rather disposed to look with some degree of doubt on even what is good when proposed to them.

Where so many substances serve the purpose more or less effectively it is but natural that the system of selection for trial should be to a large extent empirical, and consequently materials connected with the kitchen have been very largely drawn upon; but, with the exception of coffee, we do not know of any one that has found much favour amongst photographers generally. Serum of milk has been frequently proposed, but seems to have attracted little attention, and our present object is to show that it probably possesses more value than has been hitherto presumed. A Russian photographer, M. A. de Pokorsky Joravko, has more than once sung its praises, and claimed for plates thus preserved a sensitiveness very much greater than could be produced by anything he had previously tried; and,

although we scarcely expected to find the claims thus made altogether substantiated, we have thought it well to put the matter to a crucial test, and, by a series of careful experiments, ascertain whether it has a claim to be added to the already rather numerous list of preservatives at our disposal.

For this purpose we prepared a number of ordinary bromo-iodised plates, and simply bromide plates in the bath, as well as a number of emulsion plates. These were preserved with beer and albumen, tannin, Colonel Wortley's salicine, Mr. M. Carey Lea's tannin and albumen, and the serum, the last-named being prepared in the manner recommended by M. Joravko, at page 195 of our last volume. Ten ounces of skimmed milk were heated to 80° C, and the casein thrown down by the addition of a drachm of glacial acetic acid in half-an-ounce of water. The casein was strained out, and when the serum was cold the albumen of one egg was added. The liquid was then boiled for a few minutes and allowed to cool. It was then filtered, and to each ounce was added three grains of pyrogallic acid. A portion of this was made neutral, or, rather, slightly alkaline, with carbonate of soda. The plates were exposed on a suitable test subject, consisting of a garden, in which stands a studio painted white, a number of trees, a large flower-bed, and a foreground of grass. The lens was a wide-angle doublet with an $\frac{f}{30}$ stop, and as the afternoon was rather dull an exposure of one minute was given to each plate. The light was pretty steady, and as the plates were exposed in an Aird's camera less than five seconds elapsed between the exposures, so that, practically, each received precisely the same quantity of light. The development was conducted, in the case of the emulsion and the bromide plates, solely with alkaline pyrogallic acid, and in that of the bromo-iodised plates subsequently with acid pyro. and silver. The development in each case was pushed as far as it could be carried without fog, or till sufficient density was obtained, and a careful examination of the fixed and dried plates showed the following results:—

The coffee plate was the least satisfactory, only the higher lights being visible, and the foliage represented by clear glass. Next came the tannin, which was a little better but quite useless as a printing negative. The salicine and tannin and albumen were both better, and almost equal, but hard and patchy. The acid serum, on removal from the camera, showed the whole detail of the picture, which became much stronger immediately on the application of water to moisten the film, and in the case of the emulsion plates rapidly acquired printing density when slightly alkaline pyrogallic acid was applied. The bromo-iodised plates, as usual, required strengthening with acid pyro. and silver. The images on the alkaline serum plates were still more amply visible on removal from the camera, but fogged considerably on the application of the developer. We should have said that this preserver was not used on the bath plates, as although they were well washed before it was applied the silver had not been completely removed, for they turned quite brown from reduction. As a drawback to the greater sensitiveness of the serum preservative it was, unfortunately, only too visible that the plates were all more or less veiled with fog, and that even with plates which were subsequently exposed for a shorter time. This, we thought, might probably arise from a trace of fatty matter which undoubtedly remained in the serum, and which was readily seen as globules when a drop was examined under the microscope. To get rid of this a small quantity of sulphuric ether was added to a portion of the serum, and the mixture well shaken and allowed to stand till the liquids had separated. The serum, which before was slightly milky, was now quite clear, and plates prepared with it were found to be equally sensitive and quite free from fog.

Since the experiments here detailed were made we have still continued in the same course, and have every reason to believe that the serum is really a valuable preservative. A few days ago, while developing a bath plate preserved with serum, the whole detail came out so perfectly that we thought it a pity to intensify it in the ordinary mode with pyrogallic acid and silver. It was flooded with a weak solution of gold, and, after being well washed, a solution of bichloride of mercury was applied. This was washed off and a weak solution of iodide of potassium was then given, which changed the colour to the well-known yellowish-green, so thoroughly non-actinic that, although ordinary print may be read through the highest lights, the negative yields brilliant prints of a very excellent quality.

The stability of negatives so made has been often questioned; but while we do not mean to say that they will in all cases be as permanent as those produced in the ordinary manner, we know of at least one photographer in large practice whose work is all done by this method, and we have seen negatives in his printing-room which have been in occasional use for years, and they are apparently as good now as when first produced.

That serum of milk is a better preservative than most of those generally in use we are not yet quite prepared to say; but, so far as our experiments have gone, they seem to show that this preservative well deserves a trial. We give the experiments for what they are worth, and hope that some of our readers having sufficient leisure will go into the matter more fully.

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The recent introduction by M. Schaeffner of a new form of pyroxyline prepared from *medulline* opens up a serious question for experimental photographers. Why should we adhere so obstinately to the one substance, cellulose, as the basis of our collodion? The answer may be returned that it is because it has been found to give good—indeed, so far, the best—results. This, however, is scarcely a valid excuse for burking all further attempts at improvement in that respect. The great variety in the properties of pyroxylines prepared from different forms of cellulose or lignin alone at least hold out a hope that other organic substances may be found which shall give even greater variety and, possibly, better results. Of the substances already employed, either experimentally or otherwise, in the manufacture of pyroxyline—namely, cotton, flax, hemp, wood-shavings or sawdust, paper, linen, and, lastly, medulline—each exhibits properties to some extent peculiarly its own. The last upon the list, medulline—the name given to the pith of the elder, sunflower, lilac, and probably others—consists of cellulose in a nearly pure state; its previous use for the purpose in hand has been hindered by technical difficulties, which M. Schaeffner has at last successfully surmounted, and can now produce from it a collodion limpid, free from structure, and of greater sensitiveness than that made from other sources. This is certainly a step in the right direction. Some time ago we were told of a new organic pyroxyline giving great density combined with sensitiveness, said to be made from a substance "not hitherto associated with collodion;" but beyond a hint that the substance was gelatine we have been told very little as to the method of its preparation. We certainly stand in need of some such novelty, and he will, indeed, confer a boon upon photographers who first shall have the courage to make a raid upon the vegetable kingdom, which contains many substances worthy of being enlisted in the service of the collodion manufacturer.

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## THE METHYLAL DEVELOPER.

In the last issue of the *Photographic News* Mr. E. T. Rolls gives an account of his unsuccessful experiments with the methylal developer, and invites me to point out where in this process error is most likely to happen. Simultaneously Mr. G. Watmough Webster, in The British Journal of Photography, describes his unsuccessful experiments. These unfavourable opinions of the substance which gave me such satisfaction a few weeks ago, have induced me to repeat my experiments in order to test the correctness of my first observations. The result I obtained is just as favourable to the new developer as previously.

The process I adopted differs in some details from that of your correspondents, and that must be the cause of the different results. Supposing that the comparison of the details may be of some utility to experimentalists with the methylal, I give here some observations from my laboratory notes.

All derivatives of alcohol are extremely complicated, and the slightest change of conditions in the manufacture may introduce new substances. But let us not for that reason reject the name of

"methylal" which Messrs. R. Kane and Malaguti first gave to the product of distillation under the low temperature of the methylic alcohol in the presence of peroxide of manganese and diluted sulphuric acid. This is an objection made by Mr. Webster.

I have not made an analysis of the methylal prepared by myself, to ascertain whether it is a pure product or mixed with a dozen or two of different substances so easily formed under similar conditions; but its characteristics being very nearly the same as given by MM. Pelouze and Fremy permit me to take it for methylal—I shall not add "pure;" but, at all events, I am very glad that the new substance will not increase the number of bottles on the shelves of my laboratory labelled "X. Y. Z." or "?."

To prepare methylal I got some rectified wood naphtha from the distiller, which was of a light golden tint. I tested for specific gravity; it gave 0·850, the temperature of the room being 78° Fah. In the glass retort, which was of the capacity of more than one gallon, I introduced—first, some broken glass, in order to prevent the excessive bumping observed in my first experiments; then, on the suggestion of the Editors of The British Journal of Photography, I diminished the quantity of peroxide of manganese.

| | |
|---|---|
| Wood naphtha | 20 ounces, |
| Peroxide of manganese | 15 „ |

were mixed and introduced into the retort.

| | |
|---|---|
| Water | 20 ounces, |
| Sulphuric acid, s. g. 1·800 | 30 „ |

mixed in a separate glass flask, and, after cooling, were added to the first contents, and the retort was inserted in the water bath, connected in the usual way with the condenser. A thermometer was introduced into the retort for the observation of the temperature. At 180° Fah. bubbles first made their appearance; at 190° all the mass was in froth, occupying nearly three-fourths of the retort. The supply of gas under the water bath was so regulated that a temperature of 190° was constantly kept. After two hours seven ounces of the methylal had collected. This had a specific gravity of 0·856, gave an acid reaction, and boiled at 142°. Night interrupted the operation.

Next morning distillation was resumed, and after six hours the distillate amounted together to only twelve and a-half ounces, of the specific gravity of 0·900. It was perfectly colourless, very mobile, and of strong odour. Tested with nitrate of baryta it did not show the slightest trace of sulphuric acid. To secure that result the temperature of the distillation was purposely kept below the boiling point of water. Next it was ignited, and the very pale blue flame satisfied me of the absence of the methylic ether, which burns with a bright flame. But the formation of the ether could scarcely be expected, remembering that the ether-producing temperature is between 260° and 310°.

At this stage I consider the methylal ready for photographic use. I do not rectify it over the carbonate of lime. I use Mawson's bromo-iodised collodion. My nitrate bath was prepared some ten or twelve months ago, but not much used, my experiments of late being more in the direction of emulsions.

The developer prepared on this occasion was—

| | |
|---|---|
| Sulphate of iron and ammonia | ½ ounce. |
| Water | 10 ounces. |
| Methylal | ½ ounce. |

Acetic iron developer of the corresponding strength was prepared, and tried on one half of the same plate cut in two. The exposure was equal, but so conducted that when it was too short for the acetic iron it was found to be correct for the methylal developer. That satisfied me again of the possibility of shortening the exposure when methylal is substituted for acetic acid.

Notwithstanding the very unfavourable opinion of Mr. Webster on the new developer he, nevertheless, admits the shortening of the exposure by one-half. He says:—

"Plate 1, exposed 30 seconds, developed with C (acetic iron).
„ 2, „ 15 „ „ „ A (methylal).
*Results*—Plate 2 developed almost as quickly as plate 1, and at the first glance seemed almost as well exposed; but a slight examination showed that the negative was *very thin* in comparison with the other, and so to the casual observer an impression of equal exposure would be conveyed."

Such is, also, Mr. E. T. Rolls's opinion, when he says:—

"The results were disappointing; although, with wonderfully short exposure, the image flashed out instantly the developer was applied. It remained, after intensifying, very thin and weak."

Mr. Webster evidently confounds sensitiveness with intensity. I, certainly, in comparing his No. 1 with No. 2, should look for the amount of details to form my opinion of the shortening of the exposure.

The failures of these two gentlemen lay in the difficulty of obtaining necessary intensity. This was not the case with me. My negatives are not only perfectly clear, but so intense, after the first application of the developer, that rèdevelopment has not been resorted to. Mr. Webster also complains of the general fog. In my experiments I found the methylal has such a powerful restraining action that with the same proportions of the methylal in the water any quantity of iron salt can be used. That is very important, remembering that the stronger the developer the shorter is the exposure.

I must observe here that I prolonged the development generally more than is possible with the acetic iron developer. Some shining silver patches made their appearance on the surface of the liquid; but no metallic deposit was formed on the collodion film, while the solarised parts were gradually gaining in intensity.

I enclose the negative I have last taken for your inspection.

L. Warnerke.

P.S.—I have been told that M. Alexandre, who first advised the use of methylal in the developer, has inserted a reclamation in the *Moniteur de la Photographie*, in which he explains his reason for being offended with me for publishing my experiments. Having no occasion to read the *Moniteur* I really cannot guess in what I can have displeased M. Alexandre; but if he will communicate his objections to me I shall be most willing to rectify any fault on my part, if there were really any committed.—L. W.

[The negative sent by Mr. Warnerke is a good printing one, possessing ample density and full gradation.—Eds.]

## EMULSION PHOTOGRAPHY.

The London correspondent of the New York *Photographic Times*, who prefers to be known as "A. P. C.," has contributed to that serial an article on Mr. Newton's paper *On Emulsions*, recently published in The British Journal of Photography, which shows that the writer has, in respect of emulsions, acquired a very thorough knowledge of his subject. The practical directions given for the preparation of "washed emulsion" will be appreciated. The article is as follows:—

Mr. Newton's very interesting paper on emulsions has just reached us, giving a new jog to the already lively emulsion controversy. Mr. Newton's treatment of the subject is in some respects new, but the principal feature of allowing the nitrate to act on the emulsion until it is in a state which would fog at once on applying the developer, and then bringing it into a good state by the addition of a chloride, has been in a different way anticipated by Mr. Stillman, who showed in The British Journal of Photography, two years or more ago, that an emulsion kept for weeks under as strong an action of nitrate of silver as possible was made to work clearly by the addition of enough bromide to convert all the silver and leave an excess of about two grains per ounce of bromide. He found that by this treatment the emulsion improves in rapidity during about six weeks. To his emulsions there was, however, added a trace of nitric acid at the first, and following these experiments, lately, I find that a bromide emulsion can be kept for two or three months without fog with as large an excess of silver as it will hold in solution, by the addition of three minims of nitric acid per ounce. With most samples of pyroxyline, however, this treatment will, after a week or ten days, begin to act on the texture of the film, and make it look dusty and dull when dried, causing bad definition, resembling a print on blotting-paper. Mr. Newton's treatment with a chloride alone seems an advance in this direction if equal sensitiveness be gained, as the addition of nitric acid, or any other, injures the fluidity of the emulsion just as water does. Of the work done by his process I have no room for doubt, having seen some quite exquisite prints from some of the negatives he has produced by it.

One result I have found from emulsions treated in this way, and which I have not seen noticed, is that they have no halation, and therefore require no backing. An emulsion which, used an hour after being mixed, will give a thin translucent-looking film with halation in the extreme, will after two or three days give a creamy opaque one which does not blur in the least. Moreover, the conversion of the silver is complete, and there is much less tendency to black spots and comets.

But I must say, with regard to the practice of plunging the plate into the preservative bath without washing, as Mr. Newton recommends, that even more than in Carey Lea's process it tends to induce unequal sensitiveness in the plates. Mr. Lea plunges a plate

containing large excess of nitrate of silver into a bath containing tannin and gallic acid with albumen. The greater part of the silver is left in the bath, which thus changes its composition with each successive plate. Now a film containing free nitrate and nitric acid may safely be plunged into a weak solution of tannin, because the acid restrains the reduction of the silver until the plate is dry, and the silver in the first few plates will be entirely soaked out into the preservative; but afterwards, as the nitrate, tannin, and nitric acid accumulate together in the bath, the film must have a greater and greater tendency to spontaneous decomposition and fog after keeping. Mr. Newton's plates will, on the contrary, leave more and more soluble chloride in the preservative, and each successive film will be more and more charged with this chloride to the loss of sensitiveness.

It is surprising how rapidly the soluble salts are eliminated from the film, when it has been treated as Mr. Newton treats his emulsion, by keeping it under the action of nitrate of silver. I have repeatedly tried films of this kind where excess of bromide had been added, and found that the soluble salt had entirely gone before the greasiness had been overcome by washing under the tap.

But preservative baths are all out of date since the washed emlusion has come into use. Mr. Newton must make the step further in advance, and discard even his excellent laudanum and squills preservative, which might be substantially added to the washed and redissolved emulsion. The tannin and opium are ingredients which, *especially the latter*, are desirable additions to an emulsion which is to be dried without washing, as both dry without crystallisation, and make the film more readily permeable to the developer.

In my own experiments, lately, with washed emulsions I have carefully tried plates prepared with the Liverpool Company's emulsion against washed plates with a preservative bath, and the emulsion for which contained an excess of free nitrate of silver. The latter had no advantage in sensitiveness, but had a greater tendency to fog under long exposures, showing that free nitrate in the film is of no use, so far as sensitiveness is concerned, and, in fact, I came to the conclusion that when the pyroxyline is of a good quality, and has been acted on for, say two days, by free nitrate, a bromide of silver emulsion, without either chloride, free nitrate, or preservative is quicker than any other that can be compounded. Every trial here of Mr. Carey Lea's new iodised emulsion, so far as I have heard, has resulted in failure to equal the old emulsion, and his tannin albumen preservative is one almost unfilterable "mess." Perhaps the albumen from the eggs of republican hens is less conservative, and yields to new methods more than on this side; but ours will not mix with tannin without coagulating, whatever order we mix them in.

The possession of an emulsion with maximum rapidity, great opacity requiring neither substratum nor backing to prevent halation, neither washing or preservative bath, but which dries rapidly in the air of an ordinary room, giving films of absolutely uniform density and rapidity, is so great a convenience that I am persuaded that we must leave washed films out of our calculations; and until we find that the gelatine emulsion becomes as reliable and as manageable as the collodion, we shall do best by adhering to Mr. Bolton's process.

This I now work in the following way, mainly after Mr. Stillman's indications:—

A suitable cotton being found—and the quality is more important than for an ordinary emulsion—I make a collodion of about ten grains to the ounce, unless the cotton is entirely soluble, when seven will do, and with alcohol sp. gr. ·825, two parts to one of ether for more ready solubility of the salts, I add five grains of bromide of ammonium per ounce in impalpable powder, and when it is dissolved I add fifteen grains of silver per ounce dissolved in ten minims of water, to which may be added as much alcohol as will keep it in solution when heated in hot water: but this is not necessary, as, if added without the alcohol, it will finally become entirely dissolved by agitation. I add, either at this stage or before the bromide is dissolved, two minims of pure nitric acid per ounce. This is not indispensable, unless you prefer to finish with excess of silver, which requires less washing; but it gives an advantage, I imagine, by acting on the pyroxyline.

The emulsion is well shaken until the silver is all taken up, and then must be shaken twice a day for two or three days, when add five grains more of bromide of ammonium as before, and agitate from time to time, until on testing the emulsion by pouring a little on a bit of glass, and dropping on it a drop of concentrated solution of pyrogallic acid in alcohol, it shows no tendency to blacken after ten minutes of the action of the pyrogallic. If the nitric acid has been used it is now ready for washing; if not, the emulsion may be left for a day longer, when it must be poured into a broad, flat dish, so that ten ounces shall cover about two square feet. Keep it in agitation, so that it shall not dry on the surface until it begins to be gelatinous throughout. When it breaks into clots on moving it about in the dish pour on it about forty ounces of distilled water, and let it stand for an hour; then put it under the tap and let the water run in a small stream until when, detached from the bottom of the dish, it sinks in the water. Now give it a final soaking in distilled water and put it in a screw-press between sheets of blotting-paper and press out the moisture as completely as possibly; dry in an oven with every precaution against gas and sulphur fumes.

When perfectly dry put it in a bottle which holds more than the amount you are going to make up, and for every forty grains of the dried emulsion put an ounce of the purest alcohol obtainable (not lower than ·805), and, allowing it to soak for an hour or so, pour on an equal quantity of ether, and agitate from time to time very thoroughly. After two or three days the emulsion will be redissolved, and must be filtered through cotton or tow losely pressed into the tube of a funnel, allowing it to run *through the same cotton twice.* The funnel may be replaced by a collodion filter; but I prefer a funnel with a narrow top and ground to a plate of glass to prevent evaporation. In this the cotton should be pressed so as to allow ten ounces to pass in about an hour. It will keep indefinitely, is more adherent, and flows more smoothly the longer it is kept.

If the film it gives now does not give sufficient density add to the emulsion half-a-grain to one grain per ounce of pure tannin dissolved in alcohol, and filter through paper. Most samples of tannin are acid, and such should be made neutral to test paper. To those who care to take the trouble, it is to be recommended to make a saturated solution of tannin in distilled water, and add ammonia till it is neutral or faintly alkaline, then filter carefully, and dry on a sand-bath. This purified tannin may be added, in powder, to the emulsion, or, better, dissolved in alcohol as above.

The glass should be well cleaned and have a border of india-rubber solution.

If you fancy finishing the emulsion from an excess of silver, add three instead of five grains of bromide of ammonium at the second dose. In this case nitric acid *must* be added, and the emulsion be kept most carefully from all light.

A. P. C.

## CLEAN HANDS AND ALKALINE DEVELOPMENT.

I have noticed several suggestions for cleansing the stains from the fingers caused by using the alkaline developer.

The most effectual and easy method for removing any discolouration arising from this cause is simply to rub the stains with a mixture of equal parts of hydrochloric acid and water, rinse the hands in clean water without soap to remove the acid, and the stains will be found to have disappeared. No danger need be apprehended from this treatment.

The application of a piece of pumice-stone will expedite matters.

Edward Dunmore.

## FOREIGN NOTES AND NEWS.

Particulars of M. Rodriguez's Process of Heliogravure.—New Photo-Engraving Process in Half-Tone.—Erroneous Notions in Connection with Toughened Glass.—Photography at the American Exhibition of 1876.—Nitric Acid as a Preservative for Albumen.—The Vienna Photographic Exhibition.—The French Police and Photography.

In the last numbers of the *Bulletin de la Societé Française* and the *Moniteur* appears the full text of the paper read by M. Rodriguez before the meeting of the Photographic Society of France, at its sitting of the 7th August, from which we extract the following particulars of that gentleman's methods of photo-engraving:—The sensitive surface is formed by coating thin and finely-polished zinc plates with a solution of bitumen in benzole, to which is added a small proportion of essence of lavender in order to prevent the too rapid evaporation of the solvent, which would cause inequalities in the film. After coating the plate it is heated until the smell of the essence of lavender has disappeared. It is then exposed under a negative in the ordinary way, both the contact surfaces being rubbed gently with a little powdered talc in order to prevent adherence. The development is effected by plunging the plate into a dish containing spirit of turpentine, and is generally very rapid; but it should not be carried to its full extent, as the subsequent treatment continues the effect to some extent. After removing the plate from the turpentine it is washed under a tolerably-strong jet of water, delivered through a rose, in order that the whole of the surface may be covered as rapidly as possible. After washing the plate is treated with very dilute nitric acid, then gummed and inked.

If the plate be very thin the proof is inked and transferred to stone, from which a re-transfer is taken upon a zinc plate of sufficient thickness. For proofs of large size, however, M. Rodriguez prefers the process with bichromatised gelatine upon sheets of tin.

M. Rodriguez also gave a brief description of a new process with which he is now experimenting, and by means of which he hopes to be able to produce typographic plates in half-tone. Though still imperfect, the results which he exhibited are said to be of a very promising character. A mixture is made of essence of lavender, bitumen, and sugar of milk, the whole being well ground together until perfectly homogeneous. The sugar of milk may be replaced by any substance soluble in water or nitric acid, such as chalk, carbonate of lead, or starch. This is mixed with the solution of bitumen in turpentine, so as to form a sensitive solution of convenient consistency, which is applied to the plate in the ordinary way, care being taken not to have too thick a coating. This plate is exposed and developed as in the former case, and is then treated with weak acid as for an ordinary etching. The acid penetrates gradually through the resinous film, dissolving the sugar or other soluble matter, and thus forming the grain and reproducing the half-tints of the original.

M. de la Bastie writes to the French journals to contradict one or two misstatements or exaggerations which have appeared in connection with the "toughened glass" invented by him. The public, he says, have volunteered the title of "unbreakable" to this substance—a title against which he enters his protest. The effect of the tempering gives to the glass greater solidity and increased resistance to blows or shocks, rendering it less sensitive to the action of heat—in a word, it is made "harder" but not "unbreakable." Another belief is that it is an elastic substance, malleable in the cold, and capable of being hammered into shape, while in fact it is no more possessed of such properties than tempered steel. M. de la Bastie then proceeds to narrate the manner in which his researches originated. It is well known that melted glass poured into water takes the form of tear-shaped drops, terminating in a thin tail. These drops, which are known in this country as "Prince Rupert's drops," possess curious properties. The thick portion of the "tear" may be hammered with the greatest violence without producing the slightest effect; but if the thin portion of the tail be broken the whole mass flies into minute fragments. Arguing from these facts, M. de la Bastie conceived the idea that, though glass in the solid state cannot be dipped into water, when heated, without breaking, probably some other liquid might be discovered which might be used without causing fracture, and which would confer similar properties to those possessed by the "drops" spoken of. How far his experiments have been successful our readers are now able to judge.

It appears that the United States Centennial Commission in connection with the International Exhibition of 1876 had originally intended to devote a portion of the Art Hall specially to photography; but, owing to the great demand for space in that building, they have been obliged to relinquish the idea. An appeal has now been issued to American photographers, urging them to contribute to a fund for the purpose of erecting a special building for the exhibition of photographs and all articles pertaining to their production. The sum required is $20,000, to be issued in $10 shares, and which will be eventually repaid with interest.

Mr. H. J. Rodgers writes to *Anthony's Bulletin*, recommending nitric acid for the purpose of preserving the albumenising solution in place of ammonia or acetic acid. In addition to forming a clearer solution he claims for it that it keeps the bath in order.

We believe we may say that owing to a variety of causes, such as the short notice given, the busy time of the year at which it was opened, and the counter attractions at Brussels, the recent photographic exhibition at Vienna was not so successful as its projectors had reason to expect. Comparisons are proverbially odious, but the Brussels exhibition seems certainly to have been better patronised by the followers of the "black art." But then the Belgian society is young, and "new brooms sweep clean." However, all the branches of photography, with the unlooked-for exception of the astronomical, were represented. Portraiture being at present to the photographer what his pig is to the Irishman, "the gintleman that pays the rint," was most largely represented on the walls—fifty-five exhibitors out of a total of 106 exhibiting portraits. Amongst these enlargements, coloured and uncoloured, on plain and albumenised paper, were prominent, though not to the same extent as some short time ago.

The demand for enlargements, it would appear, is gradually being superseded by that for large direct portraits. The most successful exhibitor of the latter was undoubtedly Herr V. Angerer, whose productions are admirable both as regards choice of position and manipulation,

Of Herr Gertinger and Herr Luckhardt we need only say that they were exhibitors for it to be understood that their works displayed a rare delicacy and finish, with, perhaps, an inclination to over-retouching. Herr Kosmata, of Buda, Pesth, also exhibited some very fine specimens. From this portion of the catalogue we miss the name of Herr Dernier, of St. Petersburgh. There were also several very interesting series of photographs of national costumes, both coloured and uncoloured, the former in this case being by far the more effective.

Landscapes were exhibited by twenty-two firms, nearly all German. It is to be regretted that none of our most eminent photographers exhibited in this department. The specimens which attracted most attention were Remelé's views in the Lybian Desert, Heiler's pictures of the country and people of the Brazilian province of Paraná, and Nicolas Karlen's views of the rectification of the Gürben in Switzerland. The landscapes of Herr Scholz, of Görlitz, were remarkable for the artistic way in which his point of sight was chosen. Mr. Brownrigg, of Dublin, was awarded a bronze medal for his landscapes, and Mr. Hedges, of Lytham, received the same honour for his studies of animals. Of these latter there were a greater number of exhibits than at the larger exhibition in 1873. Marine photography was unrepresented except in the person of Herr Rottmayer, of Trieste.

There was a large number of architectural subjects and interiors exhibited. Among these we may mention a large view of the *Sacristan's Façade of the Church of St. Stephen, Vienna*, by Dr. Heid, and others by the well-known names of Rückwart, of Berlin, and Haack, of Vienna. The last-named gentleman also distanced all other competitors in the reproduction of drawings and paintings in carbon by his direct copies from paintings in the Belvidere gallery.

In the department of autotypes, heliographs, lichtdrucks, &c., the greatest interest was evoked by the productions of Aubel and Kaiser's secret process. The productions of Braun, of Dornach, Maes, of Antwerp, Rousselon, of Paris, and Scamoni, of St. Petersburgh, were, unfortunately, conspicuous by their absence. Branneck and Maier showed a very successful lichtdruck reproduction of Schwind's *Die Schöne Melusine.*

Herr Jacobi, of Coblenz, exhibited a number of landscapes reproduced from photographs in lichtdruck, of the size of 45 × 35 centimetres, which were remarkably sharp in the details; indeed, they were not surpassed in this particular by any other exhibits.

Salomon, of Dessau, exhibited a very fine portrait with a background in the steel-etching manner. Enamels were solely exhibited by Geldmacher, of Frankfort-on-the-Maine.

Photographs of microscopic objects were only exhibited by Haack, of Vienna, and Woodward, of Washington.

A very good feature of this exhibition, and one which would admit of being still further extended with benefit to all concerned, was the show of photographic apparatus. Out of 106 exhibitors eight or nine showed what may be called photographic properties, chemicals, &c. Amongst them were Goldman's cameras and camera-stands, Klinger's tent, varnish, *passe-partouts*, sulphocyanide of ammonia, &c., &c.

We observe in the *Bulletin de la Societé Française de la Photographie* a very deplorable notice of the difficulties laid by the French police in the way of photographers who wish to obtain views of the Parisian streets, public buildings, or monuments. The intending photographer must first obtain the permission of the *Commissaire de Police des Arrondissements*, and this permission is only available for the particular building and day mentioned. The Parisian photographers would like the privilege extended to a month.

## THE RESTORATION OF FOGGING EMULSIONS.

A YEAR ago (writes Mr. S. Singer in *Anthony's Bulletin*) I found that by converting the excess of nitrate of silver in an emulsion by a liberal addition of cyanide of potassium I could restore old, foggy emulsions; but, being an amateur, I did not continue my experiments to some decided point. Reading the interesting paper of Mr. Newton on emulsions,* and seeing that the principle was the same, I was induced to give the process a thorough trial.

I took some old emulsion made by various processes whose usefulness was already destroyed, added one ounce of freshly-pre-

* See THE BRITISH JOURNAL OF PHOTOGRAPHY, page 378.

pared emulsion, converted the excess of nitrate of silver, after some hours into an excess of chloride, and the whole worked as clear, brilliant, and sensitive as by any process tried. The most wonderful discovery I find is that an emulsion so prepared, with an excess of chloride, needs no extra washing, a simple immersion in the preservative being enough. The preservative is not spoiled by this repeated immersion, but remains clear, and is, if changed at all, improved. This suggested to me the idea of substituting an alcoholic preservative instead of one of water, and I succeeded beyond any expectation. The one I have tried is only a modification of Mr. Newton's, and works well:—

| | |
|---|---|
| Alcohol | 6 ounces. |
| Tannin | 30 grains. |
| Laudanum | 2 drachms. |
| Tincture of nux vomica | 1 drachm. |

This solution throws down a precipitate, and after filtration through filter-paper will remain clear. With this alcoholic solution the whole labour of manufacturing dry plates is reduced to a minimum. "Coat the plate with emulsion." After it has set, which it does in a few seconds, flow over the alcoholic preservative the same way as you do collodion; let the solution act a few seconds on the film and pour back the surplus into the bottle. The plate is then ready for exposure; or you can let it dry, which it will do in a few minutes to a bright, clean surface. In my experiments I have not noticed any tendency to blurring in these plates; but, should that be the case, the alcoholic preservative can be easily tinted by an aniline colour to any depth, or by an alcoholic extract of alkanet root, which latter assists in organifying the film and is again redissolved by the alkaline developer.

A second modification I propose is in developing. By first flowing the film with a strong alkaline solution the whole negative can be finished with from one to three drops of an alcoholic sixty-grain solution of pyrogallic acid. Prepare, for instance, the following developer:—

No. 1.

| | |
|---|---|
| Strong aqua ammonia | 2 drachms. |
| Water | 6 ounces. |
| Bromide of ammonium | 6 grains. |

No. 2.

| | |
|---|---|
| Alcohol | 1 ounce. |
| Pyrogallic acid | 60 grains. |

After exposure wet the film; then flow over enough of No. 1 to cover the film with one sweep; let it act a few seconds on the film. Now drop into the developing cup one drop of pyro.; pour back the ammonia solution and reapply, when all detail will appear, and one or two drops of pyro., if the exposure have been correct, will finish the negative. Instead of the above, developer Colonel Stuart Wortley's can be used, namely:—

| | |
|---|---|
| Carbonate of ammonia | 80 grains, |
| Water | 1 ounce, |
| Bromide of potassium | 6 grains, |

or a combination of both, half and half. If you are not satisfied with the contrast, but want brilliant pictures, as in case of engravings, add half-a-grain more of bromide to each ounce of developer.

In conculsion: I do not pretend to have given the best formula for an alcoholic preserver; but I consider it my duty to contribute my mite to the general progress of our beautiful art, and hope that others may profit by these hints, as I am not myself so situated as to continue these very interesting experiments.

## OUR CLUB.

### No. XI.—My Friend, the Major.

Tom did not find it much of a holiday with the exception of the fresh air and the green fields, for he was kept far more constantly at work than if he had been at home, and, for the matter of that, so was I. We did not expect such a run upon our genius, but finding it so we went in to make hay whilst the sun shone, and both we and our assistants were well pleased. "Contentment is great gain," so we also appropriated the profit derived from that source.

We had so much work on hand now that we did not need to seek for more orders, but each of us went our separate ways in the morning—that is, Peter and I to one district, and Tom and Joseph their own way.

Peter and I were engaged taking pictures at the Manor House, the house and grounds of which were really beautiful; for in the glow and brightness of the sunny weather we moved on from beauty to beauty until it became too much to point out each of the varied little charming pictures of nature clothed in all the magnificence of genial summer; it fills the eye and heart with speechless enjoyment. And to think that such a place as this was thrown open at all seasons to all comers, until they wrested the right out of their own hands by the gross abuse of that which as a boon conferred was invaluable! But it is the same all the world over. No matter how great the blessing bestowed, because it is obtained without money and without price it is considered by many as valueless, and so the trees are damaged, the shrubs torn up, and the flower-plots trodden down and despoiled; then when his lordship for his own protection shuts his gates against the ruthless pilferers he is railed against as a "bloated aristocrat" and a "hater of the people."

If you get fairly introduced into a gentleman's house and grounds, and give satisfaction with the work you produce, you would be astonished at the number of sources from which the money comes pouring in. We started with the household servants, the grooms, coachman, &c., &c., which led to higher game. Sir John saw some of the work and was highly pleased with it, so we got no end of "bits" to photograph. The house, the flower garden, the forest trees, and the live stock were all included. We had transformed a little grotto in the midst of a clump of rocks into a first-rate dark room, where we had a natural flow of water, which was very handy for us.

On the morning in question I had just finished exposing a couple of plates on "Adam" and "Eve;" I do not mean the great originals, but a couple of trees which were so named for their age, size, and beauty—qualities which the originals were supposed to have possessed, I fancy. I had just entered the grotto, and was working up my plates to see the results, when I was rather startled by a familiar voice, which seemed close to my ear, exclaim—

"Yes, Sir John; I have travelled all over the world. I have seen the zebra wear his stripes beneath the nightly twinkling stars."

It was Major Brown!

"What, in the name of goodness! brings him here?" thought I. When I came forth from my hiding-place I met the lord of the manor and the Major face to face. It turned out that the Major was now flourishing as a parliamentary agent, for an election was at hand.

"Ah! Mr. Oute! glad to see you. You are looking well, sir. You must have taken my advice," and he ran his fingers over my chest and smiled.

"Yes, Major, plenty of exercise," I replied; "and for music I have the warblers of the forest"—a little bit of his own flowing language.

"You're an apt pupil, Mr. Oute," the Major replied, with a laugh. "You see, Sir John," he continued, by way of explanation, "I was delivering a series of lectures on scientific subjects for the benefit of the working classes, on which tour I had the pleasure of meeting this gentleman, who was connected with one of the institutions at which I lectured."

"A very artistic way of putting it," I said to myself.

"Sir John! Did it never occur to you how very small the world is after all?" ran on the gushing Major. "In the city's din and smoke we met before, and now in forest green we cross each other. I say, no matter into what unlikely place you go, you are sure to meet some person you have seen and known before. Sir, I was haunted from country to country by a man and his dog, until I relieved myself by putting the thing into rhyme in my note-book." With a flourish of the hand the Major pulled out the book, saying, "Would you like to hear it?"

"Oh! certainly, if it's not too long," Sir John replied, with a laugh, "and I daresay Mr. Oute would like to hear it also. We will be your audience."

"Thanks, honoured sir," exclaimed the Major, opening the note-book, and, turning over the leaves until he came to the page, he began:—

"'I've roamed o'er many lands,' so says the song.  
I've stayed where days are short, where days are long;  
Where night did reign for weeks—an endless night;  
Where day supreme did reign—unceasing light;  
'Midst bitter cold and snow, with fire to cheer;  
Where intense heat stayed on from year to year.  
And yet, from hottest zone to frozen wall,  
I find the world, from end to end, is small;  
For in my journeys, through sunshine and fog,  
I'm always meeting Jones, and Jones's dog;  
No matter where, or how, I change my ground  
Jones and his dog are always trotting round.  
'On Greenland's icy mountains, on India's coral strand;'  
By the Crystal Palace fountains, or at the Horse Guards' band;  
On the diamond-fields I met him; at the Gold Coast—Ashantee;  
Why, at Hong Kong I get him with the natives drinking tea.  
With Stanley I went away, his journey up the Nile,  
In search of Dr. Livingstone—amissing such a while.  
After a weary travel we traced the hero's way,  
And came upon his small abode just at the close of day.  
Guess my surprise on nearing it, I, stepping o'er a log,  
Saw Jones a-sitting on that tree, and with him was his dog.  
I, starting back in fear, cried out—'What! are you here again?'  
'Yes, dear boy,' he smiling said, 'You've Jones upon the brain.'  
This is the moral of my rhyme: No matter where you roam,  
You'll haunted be by one like Jones whom you before have known.  
And if you keep a diary—which at sea is termed a log—  
You'd astonished be to find how oft you enter 'man and dog.'"

"Not bad for you! Very good indeed, Major!" said Sir John, laughing and slapping him on the shoulder. Then, taking him by the arm, he said, as he looked at his watch—"But come along, or we will be too late for that meeting."

"All right, Sir John," the Major replied as he put the note-book carefully into his pocket again.

"By-by, Mr. Oute," the Major said in his usual playful way, as he turned to go. As they were walking away the Major turned and called out—"Are you staying at the 'Arms'?"

"Yes sir," I replied.

"Well, I'll just stretch my legs by walking down to the 'Arms' to to see you tonight. I want to have a talk with you about a new patent I've got—photographing in natural colours. Good—eh?"

"Yes; far to good to be true," I replied to myself.

Mark Oute.

## ON PHOTO-MECHANICAL PRINTING.*

The action of light on a chrome gelatine film is by far the most effectual means of hardening it, but if it be subjected to the light long enough to make it perfectly non-absorbent the hardening will penetrate to a depth that will interfere with the qualities desired for the other side. To avoid this difficulty the film is composed of two layers. A plate of glass is coated with a mixture of gelatine, albumen, and bichromate of potash, then dried, laid face down on a dark cloth, and exposed to the light. Then the hardening begins; the black cloth absorbs the penetrating rays of light and prevents the hardening from going too far. At the proper moment the plate is removed and washed to prevent any further action. The outer surface is still sufficiently adhesive to unite with another layer of sensitive material, which is now flowed over it in the same manner as the first; when this becomes dry it is placed in contact with a negative and exposed to light in the same manner as an albumen print.

The action is watched from the back, and is finished when all the details are just visible; if the solution have not had the coagulating material mixed with it it can now be immersed in a solution of alum, chrome alum, tannin, or their equivalent, after which it is washed for a short time in clear water and is then ready for the press, or it can be set aside for future use.

To print from such plates, after bedding in plaster of Paris in a press, the surface is sponged over with water for a minute, then wiped with a clean cloth, and a roller charged with thick printing-ink passed over it in all directions until the deepest shadows are sufficiently inked, but little or none should be seen on the middle tints; then a second roller with a thinner ink, black or tinted, is rolled over in the same manner, which deposits on the half-tints. After the inking is complete a mask is laid over the plate to preserve a clean margin, and the impression is taken.

Notwithstanding the rough usage to which it is subjected by leather rollers with stiff ink, the scraper of the lithographic press, or the iron roller of the copperplate press, continued sponging and wiping, washing with turpentine, &c., a single plate has been known to yield over four thousand impressions.

As soon as the Albertype became known other experimenters came forward with what they called improvements, but, so far, have made neither better prints nor more durable plates.

In 1869, Herr Max Gemoser announced a method of making improved printing-plates, and joined the firm of Ohm and Grossman, in Berlin. His formula was kept secret, but in 1870 it was published in a pamphlet, and proved to be a method which was in part communicated to him by Herr Albert. It was to add a resin to the chrome gelatine, and heating the plate in an oven to melt the resin on the surface in contact with the plate, whilst the upper surface was protected with a layer of flour; instead of using the simple bichromated gelatine he added seventeen other substances. After this process had been practised about six months Ohm and Grossman sent a circular to their pupils describing the Albert method of hardening the under side of the film by light, and recommending the adoption of this plan as being the best. As it may interest the curious, I will give the Gemoser or Ohm and Grossman formula in full, which is as follows:—

"*Solution No.* 1.

| | |
|---|---|
| Gelatine | 1 part. |
| Distilled water | 8 parts. |

"*Solution No.* 2.

| | |
|---|---|
| Gum myrrh | 30 grains. |
| Gum ammoniac | 20 ,, |
| Liquorice root | 50 ,, |
| Manna | 20 ,, |
| Beet sugar | 10 ,, |
| Milk sugar | 10 ,, |
| Water | 2 ounces. |

Mix and set aside for twelve hours.

"*Solution No.* 3.

| | |
|---|---|
| Bichromate of potash | ½ drachm. |
| Bichromate of ammonia | ½ ,, |
| Water | 2 ounces. |

* Concluded from page 405.

"*Solution No.* 4.

Liquor ammonia.

"*Solution No.* 5.

| | |
|---|---|
| Lupulin | 1 drachm. |
| Gum myrrh | 1 ,, |
| Gum benzoin | 36 grains. |
| Tolu balsam | 24 ,, |
| Spirits of wine (90 per cent.) | 3 ounces. |

"*Solution No* 6.

| | |
|---|---|
| Nitrate of silver | 5 grains. |
| Water | 1 ounce. |

"*Solution No.* 7.

| | |
|---|---|
| Iodide of cadmium | 4 grains. |
| Iodide of zinc | 4 ,, |
| Bromide of potassium | 4 ,, |
| Distilled water | 1 ounce. |
| Gold solution (1 to 10) | 3 drops. |

"*Solution No.* 8.

| | |
|---|---|
| The white of one egg. | |
| Water | 1 ounce. |

"The solution for coating the plates is composed of sixteen drachms of No. 1; one drachm of No. 2; eighty grains of No. 3; two drops of No. 4; thirty grains of No. 5, after shaking; five grains of No. 6; ten grains of No. 7; two and two-third drachms of No. 8. Mix well and warm to 40° Reaumur, filter through flannel, and flow over the plate previously warmed. After the plate has been dried by a moderate heat it is impressed with a picture through a negative, and then washed in water and dried; it is then covered with a layer of flour, and heated in a muffle for one or two minutes to a temperature of 80° Reaumur. This operation is for the purpose of coagulating the albumen, while the covering of flour protects the gelatine from injury by the heat. The plate is then allowed to cool in the muffle."

The pamphlet containing this, and also the Albertype process, was published in Prague, and was considered by Ohm and Grossman to be an infringement of their copyright. This resulted in a lawsuit against the publisher and an injunction against the sale of the pamphlet, but the jury decided in favour of the defendant, Herr Steinhauser, condemned the plaintiffs to pay the costs, and removed the injunction on the pamphlet.

In this trial an attempt was made to prove that Gemoser was the inventor of the "lichtdruck"—a name given to photographs in printing-ink in half-tones; but it was shown that Albert had made them in a much simpler manner two years earlier than any record he could bring.

Another modification of the Albertype is known as the heliotype, patented in England and in the United States, by Mr. Ernest Edwards. This process adopts the same materials used by Herr Albert, the only difference being that the chrome gelatine is made thick enough to sustain itself after being detached from the plate on which it is made, and is transferred to a metal plate to be printed from. The advantage claimed by this patentee is that there is no fear of breaking the plate while printing. The fragility of glass plates in the Albertype has been so greatly magnified that it might be well to notice for a moment the treatment to which the glass plates are subjected in comparison with the method adopted by the heliotype. The latter uses only a vertical pressure, whilst the Albertype uses all kinds of pressure known in printing. The glass plate is bedded in plaster of Paris on a stone, and becomes as solid as the stone itself, and in practice each press will not break on an average more than two or three plates in a year by constant printing, although both the lithographic scraper and the copperplate or roller presses are used as well as the vertical, and either of them is more trying to both plate and film than the typographic pressure.

In relation to the respective merits of the Albertype and the heliotype processes it may be well to compare the two methods more fully.

1. The same materials are used in both, viz., gelatine and bichromate of potash, and, according to the specifications, both are hardened on the back by exposure to light, and both are further hardened by the use of a coagulating material, generally chrome alum. There can be no difference here.

2. The thickness of the layer of gelatine in the Albertype is, when dry, about a two hundredth part of an inch. In the heliotype it is more than five times as thick; five times as much material must, of course, be used, but, as the cost is only a fraction of a cent to a square foot, this is a small item, but still it is slightly in favour of the Albertype. Another advantage is that in moistening the film it does not swell as much; and, as the roller must touch all parts in order to deposit the ink, it is plain that the less relief there is the better will a roller come in contact with the deepest parts.

3. *Concerning the Treatment of the Respective Films.*—The Albertype is retained upon its original base, while the heliotype is detached from it, so as to be transferred to another.

The advantage claimed by the former is the entire freedom from contraction and expansion, so that maps and designs can be made *exactly* to a scale; this is impossible with a detached film. The latter claims a more perfect surface than the Albertype, because the picture is made upon that side of the film which was in contact with the glass, and was protected from dust. In four years' practice I have never seen a plate that was damaged by dust. I must, therefore, decline to allow this claim.

4. *The Ink, and the Methods of Applying It.*—It is evident that thick or stiff ink contains more colouring matter than thin, and in the heliotype specification it is recommended to reduce the thickness of the ink with tallow or olive oil, and not with lithographic varnish, because the adhesive properties of a stiff ink and a leather roller is too trying to the detached film; the oily ink is, therefore, applied only with composition rollers.

With the Albertype adhesive or unadhesive ink may be applied with any kind of rollers. When it is desired to print a picture full of half-tone and as brilliant as an ordinary photograph the stiffest ink is applied with a leather roller; the result is that two or more different grades or thicknesses of ink can be applied one over the other without the fear of dissolving the stiff ink by repeatedly passing a roller over it charged with thin or oily ink. The Albertype method is acknowledged to have produced the most brilliant pictures in half-tone, such as portraits, landscapes, and views, taken directly from objects. In line engravings there is very little difference between the two processes; that there should be a difference of any kind is accounted for only in the toughness of the films and in the permanency with which they are attached to their supports.

With a well-hardened film of good gelatine, firmly attached to its base or support, pictures can be made with all the brilliancy of albumen photographs, and, being printed in permanent inks, they must endure as long as the surface on which they are printed. Each one can judge for himself which of the processes comes nearest to perfection. Improvements will undoubtedly be made; even now steam presses are being used to print the Albertype.

With the facilities we now have, and which are fast developing themselves in collographic printing, there seems to be nothing in the way of making photography the most perfect medium through which to secure illustrations for books, or for any purpose for which pictures are required. The printing-ink gives us permanency, and the unerring eye of the camera will record what it sees with a fidelity unapproached by art, and in a universal language.

The time is not far distant when every city or town of any importance will have its photo-mechanical printing establishment, and photographers will avail themselves of its facilities for doing all their printing; this it can do now cheaper than is possible by the silver or chemical method. This is not mere conjecture. The actual time required to produce a dozen pictures after the negative is made is no more than is necessary for the same number of silver prints, and the cost of material is much less.

Much more might be said on this subject, but seeing is better than hearing, and as the Albertype process is in practical operation in our midst all may see it who will and judge of its merits for themselves.

E. Bierstadt.

# Meetings of Societies.

## VIENNA PHOTOGRAPHIC SOCIETY.

This Society had an extraordinary meeting shortly before the close of the exhibition, at which a number of strangers were present.

Little business was transacted, the time being occupied by various discussions. The first of these was upon the desirability of international co-operation for the protection of the copyright of the producers of original photographs. The general opinion seemed to be that the sale of unauthorised copies will only be checked when the original producers issue their works so cheaply as to make "piracy" unprofitable, and combine to institute immediate proceedings in a court of law against the infringers of their rights. This last mode of procedure has been successfully tried in Vienna against one Johann Knizek.

A discussion was then raised upon a bye-law forbidding the transport of pyroxyline by rail on account of its explosive nature.

Herr Münch (of Trapp and Münch) spoke at great length. He said that in 1868 he received his first consignment by rail of five pounds of collodion cotton, and immediately after an intimation from the chief of the customs that the transport of pyroxyline was prohibited. He then set himself the Sisyphus-like task of getting a special permit. After seven months he succeeded so far as to get permission to remove five pounds a month in one or two pound parcels; but the way in which he was required to pack these parcels was changed as often and as capriciously as Laban changed the services he required from Jacob. Sometimes he was required to pack it damp, sometimes dry, and once he had to pay twenty florins duty upon a package containing two pounds nett of pyroxyline and weighing eight or ten pounds gross weight. He contended that the difficulty of transporting collodion cotton was a great hardship to photographers now that they employed it so much; that the explosiveness of pyroxyline was greatly exaggerated; that it was not so explosive as gun-cotton; and that it was unfair to prohibit its transport when ether—not to speak of dynamite—was allowed to pass freely.

Herr Münch carried the meeting with him, and it was resolved to petition the Minister of Commerce, through the President, to remove the prohibition. [Some of our readers may remember that about a year ago the authorities of the Prussian post-office prohibited the transmission of small quantities of ether and pyroxyline by post. It seems to us that Herr Münch has made out his case against the customs officers in so far as the accusation of capricious dealing goes, yet it is a question how far the authorities would be justified in allowing any person to transport unrestricted quantities of pyroxyline, dynamite, nitro-glycerine, or any other explosive material in ordinary trains.

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At the last ordinary meeting of the same Society Herr Riewel explained his method of printing a head-and-shoulder portrait from a group when the head of the person required is almost in contact with another head, a pillar, a curtain, or any other object likely to spoil the effect of the portrait. [We gave an account of Herr Riewel's method some time ago.]

The President also showed some photographic groups by Herr Lönborg, of Copenhagen, in which a number of single head-and-shoulder portraits were combined into groups.

Herr Luckhardt remarked that Herr Lönborg's groups reminded him of Disderi's mosaic pictures, and could be produced by cutting out the head and shoulders of a number of separate portraits, arranging them and then pasting them together. A somewhat similar method was employed in a large studio in the north, when the number of persons to be grouped was so large as to make it unlikely that every individual could keep steady or be in focus; but the trouble and expense of taking the portraits separately was seldom repaid by the number of copies required, one copy to each person being about the usual quantity required.

Herr Carl Haack then showed the apparatus which he uses when photographing microscopic objects, and which is the result of a long series of experiments.

In reply to the question—"In what way can children's portraits be after-lighted?"

Herr Ungar said he had already explained that, and that he had used the light of a candle for such after-lighting.

A discussion then arose as to the best means of curing or removing dry spots on the undeveloped negative, in which Herr Angerer and Herr Eppel took part. The former remarked that with long exposures he employed glycerine successfully.

Herr Gertinger recommended laying a piece of wet paper on the wrong side of the plate, or the addition of a little water to the collodion.

The meeting also discussed several local topics, such as the amount of space the Society would be likely to require at the forthcoming exhibition at Philadelphia, &c., &c., and was then adjourned.

# Miscellanea.

Photographic Status.—Mr. George Smith (Dornach), writing to us on this subject, says:—"Photographers who complain of their social status, to tell the truth, are clamouring for what does not belong to them. A broken-down cobbler or lawyer's clerk infallibly turns his attention either to politics or photography. In the first case he calls himself a republican, aspires to the highest positions, with no more aptitude for them than for his old trade; by degrees he is found out, the name he made for himself among the ignorant by force of shouting has no longer a charm even for them, and in time he sinks into a merited oblivion. If, on the other hand, photography has the misfortune to receive him into her ranks he dubs himself an artist, considers himself a member of a profession, and is indignant that he is not immediately awarded that social status which has never been denied to the real worker and thinker, although it may be long in coming."

My Neighbours at the Seaside.—Mrs. Cameron.—*Freshwater Bay, Isle of Wight.*—My nearest neighbour is Mrs. Cameron, the celebrated photographer, whose wonderful portraits are well known in London. The last time I passed Colnaghi's shop there were three of them—one of Tennyson, another of Longfellow, and a third of Joachim, the notable violinist. Mrs. Cameron has a style of her own. It was quite original, and has, as far as I know, never effectually been imitated. This lady's house is very remarkable. It might be called with propriety "The House of the Gables," for in the front of it there are six gables, and altogether—front, back, and ends—there are at least fourteen. I counted fourteen, but I suspect that behind the trees at the back there are more. The real name of the house is "Dimbola," called so from a coffee plantation in Ceylon, which is the source of the family wealth. Mrs. Cameron's studio is in the house, and rumour says that she has a very large stock of photographs there—not merely portraits, but groups of figures. I met accidentally a man who is often employed as her model. He told me that once he stood clothed in complete steel armour. "What was that for?" I asked. "Well, it was to go with one of Mr. Tennyson's poems," was the reply. One would like to see this collection, and if I were an American no doubt I should get a sight of it; but being a mere modest, unobtrusive Englishman I shall not "try it on," as the phrase is. Shelley, the poet, used to boast that he always went where he wished to go until he was stopped. A friend of mine

with whom I travelled in Germany many years ago used for a time to do this, but at last his impertinent curiosity was effectually quenched. He was, in his usually impudent way, walking up a broad stone staircase, when suddenly he was confronted by a fierce German sentinel with a very minatory look. What the man said my friend did not understand; but, interpreting it by the look, he fancied it meant arrest, and so down he "scudded." No sentinel stands at Mrs. Cameron's door; nor needs there any, as far as I am concerned. It is enough for me to know that the lady does not like obtrusive visitors. But a few words more about her house. It is almost entirely covered with ivy, and would be a very picturesque house but for a staring, stone, four-square, turreted tower which she has lately erected. This anomalous structure is in the middle of the front line of the house, slightly projecting, and very much damages the generally quiet, picturesque, rural characters of the building. The situation of Mrs. Cameron's residence is admirable. It commands Freshwater Downs and the sea, and fronts the south-east. There is a Mr. Cameron, but he is a very old man, and is rarely heard of here.—*From "My Letter in Leisure," in the Liverpool Journal.*

Professional Dignity.—Mr. Bogardus, in speaking on this subject before the Convention of the N.P.A., said:—"Now for the dignity of the profession. There are many instances in which we hardly know what to do. We try to preserve our dignity and our temper both. When a lady comes to me and tells me she wants a picture, and that she has been to Fredericks' and Gurney's, and all of them have given her a crooked mouth, and she is not going to have any more taken there, I feel it my duty to tell her I cannot take her a picture without taking her just as she is. There is no use in our attempting to straighten the crooked mouth. I tell her my cameras will not lie; if they did I would throw them out of the window. I feel provoked when people come and ask such impossibilities. Another lady came with her daughter most terribly cross-eyed, and she said if I would examine her daughter's eyes closely I should see a slight cast in one eye. I saw it when the girl came upstairs. I do not know why it was, but in the good old daguerreotype times I used to know, when a lady came upstairs, how she would trouble me in making her picture; and when the head came up I was looking for good subjects to come up. I was always afraid it was a bad one. We did not retouch in those old times. There are some cases in which it is impossible to preserve your dignity. They will tell me they have visited several places, and one picture is just as bad as the other. It may be the last photographer has taken the wrong side of the lady's face. There are thousands of pictures that would be improved if only the other side of the face were taken. You must always study your face. That is the future of photography. The manipulating is, of course, difficult; but we have mastered that to a great extent, and we have now got to learn to study faces and find out the best side—the best view of their face. And that is the secret of some of your crack photographers. That is why they take such good photographs. Now, they have gained their reputation by knowing which side of the lady's face shall be the best. Many a time I have made the lady take her hair all down, so as to get the best side of the face, simply because it was much better than the other. They will do it when they find that they are going to get a better picture that way."

# Correspondence.

## BLISTERING OF GELATINE FILMS.

*To the* Editors.

Gentlemen,—Your correspondent's troubles from the above cause must, I think, arise from using the emulsion after it has begun to decompose. I experienced the same trouble a few times, but found it always arose from using an old emulsion.

If he will try Nelson's patent opaque gelatine, sold at nearly every grocer's, and use fifteen grains of it to the ounce only (too much tends to blistering during development), he will not be troubled any longer with the defect of which he complains, provided he uses the emulsion within two or three days after making. A drachm or two of methylated spirit makes it keep somewhat longer, and also flow more evenly over the glass, without diminishing its sensitiveness.

I have used the above over two years with perfect success, and cannot understand why it is not more generally used instead of collodion, the composition of which is so variable; but with gelatine it is always the same, and I have found no limit to the amount of density obtainable, combined with the greatest rapidity.—I am, yours, &c., Amateur.

*September* 4, 1875.

## THE METHYLAL DEVELOPER.

*To the* Editors.

Gentlemen,—I have been much interested lately in the favourable accounts given in various quarters of the qualities of the "methylal" developer, and had decided to take the earliest opportunity of preparing some of that substance for experimental purposes. In your last week's issue, however, Mr. G. W. Webster throws a wet blanket upon my expectations. Knowing Mr. Webster to be a careful and a skilful experimentalist, his opinion upon such a subject carries with it, to my mind, great weight; but, on the other hand, M. Alexandre, Mr. Warnerke, and yourselves have borne testimony diametrically opposite to Mr. Webster's. These different results appeared to me at first sight almost inexplicable; but upon considering the matter carefully I have come to the conclusion that each party may be correct—that, in fact, they are working with different materials. Upon comparing the formulæ given by Messrs. Warnerke and Webster respectively they will be found to agree pretty closely if the necessary allowance be made for the quantities of the liquids being given by measure in the formula of the latter gentleman; but the complicated nature of the reactions of acids with the alcohols, and the widely-varying products arising from very trivial differences in treatment, render it more than probable that from the same materials many different substances may be distilled. Now, Mr. Warnerke is particular in stating that he distilled his mixture over a *very slow fire*, while Mr. Webster gives no particulars beyond the fact that "a small Bunsen burner gave more than enough heat." Is it not possible that sufficient heat may have been applied to effect etherification of a portion of the spirit, and thus bring about in Mr. Webster's case the "mixture of several compounds" of which he complains?—I am, yours, &c., Ferro.

*September* 8, 1875.

## DENSE PYROXYLINE FOR EMULSION WORK.

*To the* Editors.

Gentlemen,—I have been experimenting lately in the direction of washed emulsions, and have experienced considerable difficulty in producing density combined with sensitiveness by the use of alkaline development alone. This, I believe, is caused by an unsuitable pyroxyline. I have tried several commercial samples, but none come up to my expectations. Curiously enough the same emulsions which work perfectly in the ordinary way, when poured out give results devoid of all density. Can it be that the action of the water in washing the *pellicle* is chargeable with this effect? If so, why is the result not the same when the *film* is washed? Some months ago it was announced that Colonel Wortley had succeeded in producing a new description of pyroxyline, combining the highest sensitiveness with great density, but I have been disappointed in not meeting with any description of this product. Have the particulars of its manufacture been disclosed? If not, is there any probability of such particulars appearing? or can the preparation be had in London? Apologising for occupying your space, —I am, yours, &c., W. Knox.

*Glasgow, September* 4, 1875.

[As regards the action of water upon the pellicle see our remarks in the leading article at page 412. We know nothing as to the preparation of the substance in question; perhaps Colonel Wortley may be willing to assist you.—Eds.]

## EXCHANGE COLUMN.

Wanted to exchange, one hundred first-class stereo. slides for a set of three-inch coloured lantern slides illustrating the *Pilgrim's Progress.*—Address, D. Johnston, photographer, Forres, Morayshire.

A half-plate Voigtlander lens, in good condition; a half-plate Lerebours, nearly new; and a quarter-plate Cox, never used—any of which, and the difference in value adjusted, will be exchanged for a 1 B long Dallmeyer lens.—Address, J. K., 24, Queen-street, Whitehaven.

## ANSWERS TO CORRESPONDENTS.

Photographs Registered.—

E. Whitby and Son, Yeovil.—*View of "Nine Springs," Yeovil.*

William Stevenson, Todmorden.—*View of Todmorden Town Hall.*

John William Francis, Haverfordwest.—*Two Portraits of Mr. Brinley Richards.*

Thos. Wood, Darlington.—*Photograph from Painting of Opening of Stockton and Darlington Railway,* 1825.

A. G. Massey, Armagh.—*Six Views of Newry, Two Views at Sheepbridge, and Three Views at Portadown.*

A. E. Lesage, Dublin.—*Four Portraits of Monsignor Capel and One Portrait of Daniel O'Connell from a daguerreotype.*

☞ *Correspondents should never write on both sides of the paper.*

William Weston (Pendlebury).—In our next.

Tyro.—Any good blacklead pencil will answer for retouching a negative.

J. S. T.—Until we have access to the specification it will be impossible to indicate how much is new and how much is old in the claim.

G. S. S.—1. The blisters are undoubtedly caused by the gum.—2. A saturated aqueous solution of gallic acid will contain about four grains to the ounce.

N. Gillespie.—The collodion you use will not answer for producing reversed pictures. It must be a purely *bromised* collodion, and the image *must* be developed by the alkaline method. Under these conditions failure will be impossible.

R. D. Roberts.—Do not allow any optician, even the one by whom it was made, to alter your lens. The small chip is innocuous. Paint it over with a little black varnish, and you will not be able when working with it to perceive any deterioration.

MacVittie.—There is no test for iodine so handy or convenient as starch. If there be any liquid which is supposed to contain iodine immerse it in a strip of paper that has been sized with starch. If any iodine be present the paper immediately becomes of a deep blue colour inclining to purple.

C. B.—No book has been issued on the production of lantern transparencies, but numerous articles on the subject have been published in this Journal and also in our Almanac. Transparencies may be taken direct in the camera, although it is much more satisfactory to obtain them from a negative.

A Barrister asks—"Who makes the best lenses for photographic purposes?" Before we could answer such a question it would be necessary for us to become acquainted with the work of all the photographic lens makers in the world. In reply to a second query we have to state that by "astigmation" is meant the property some lenses possess of causing a point in the margin of the picture to be elongated.

Ascot.—No portion of a portrait lens can be used as an object-glass for a telescope. By an alteration in the curvature of the front lens it could be converted into a telescopic objective; but, as four surfaces would have to be reground and polished, it is obvious that the experiment would be attended with considerable expense.

Rev. T. B.—For keeping a wet plate in good condition for an hour it is not necessary that a preservative should be used. The following is a method we have employed with great success:—After sensitising the plate it is immersed for a short time in a *very weak* silver bath. When placed in the dark slide it is backed with a sheet of moist blotting-paper; and the dark slide is then wrapped up in a piece of thin india-rubber-lined cloth. By this means the evaporation from the surface is checked to such an extent as to cause the plate to remain moist for several hours.

Rival Burnishers.—Mr. J. P. Bass, of Bangor, Maine, U.S., has sent us a communication relative to the disputed question of the Weston and Entrekin burnishers. He has also forwarded for publication the decision of the Board of Examiners respecting the Weston patent, the Examiners' decision being affirmed May 8th, 1875. Who "Buckwalter" is we learn from Mr. Bass, who says:—"Buckwalter was an operator of Entrekin's, and you will see by the decision that it was a put up job to break down Weston's patent. This will prove to you that Weston was the real inventor of the non-rotating burnisher." We now append the "decision," which is signed by "R. L. B. Clarke and M. S. Hopkins, Examiners-in-Chief":—"Weston applied for a patent July 20, 1872, and patent issued September 10, 1872. This went to several reissues and the invention went into general and very successful public use. Buckwalter applied for a patent September 1, 1874, within ten days of two years after a patent had issued to Weston, and over two years and two months after he had applied. From the preliminary statement of Weston, and from the matters set forth in his original specification, there can be little doubt that the invention was in public use some considerable time before he made application. But this cannot be considered in evidence. The facts without this make a very strong case for Buckwalter to overcome. He claims to have made the invention, so far as it is illustrated in exhibit 'A,' as early as 1866; that he used this exhibit to burnish photographs, to a very large extent, from that time to 1874—about eight years; that it was in almost daily use in his finishing-room; that he made no improvement or change in it until about four months prior to his application, and did not consider it a perfect invention until that improvement was made. Exhibit 'A' was an old burnisher altered over. The improvement made four months before the application was, in fact, essential to make the machine practicable in the use of the great power and pressure necessary to successful operation. This being so, the invention as perfected by Buckwalter is junior to that of Weston; and unless, having been the first to conceive of it in 1866, he was using due diligence to perfect and test it and give it to the public in the meantime, he cannot be adjudged the prior inventor and entitled to a patent. He pretends and swears that he was using this crude embodiment of the invention exhibit 'A' daily in his regular business without change or without any effort to procure a patent, and gave it to the public. If the use was as stated by himself it might not have been such a use accompanied with public knowledge as would defeat Weston's patent; but it evidently showed sufficient to prevent Buckwalter from being able to sustain one, if issued to himself under the circumstances. But the credibility of Buckwalter is greatly impaired and his testimony shaken by the evidence of his own partner of two years, who had no knowledge of exhibit 'A,' or of its having been used in their business, and who swears that it could not have been in the finishing-room and used without his knowledge. The exhibit itself furnishes the strongest proof against Buckwalter's statements and claims. It bears no evidence of the use stated, no friction wear, no oil marks, no cutting away of the burnishing-plate, no such marks of long and high and frequent heating as would be shown by such use or any considerable use. We are strongly of the impression that the exhibit was manufactured or tinkered up for the purpose of evidence. But whether it was or not, if it be all that is claimed for it, and has been used as stated, we see nothing in the case to justify our disturbing the finding of the Examiner of Interferences, and we must award priority to Weston.—R. L. B. Clarke, Marcus S. Hopkins, Examiners-in-Chief. Ex., J. A. W."——As our readers have now had sufficient of the rival burnishers, all communications on this subject must in future be sent to the advertisement department of this Journal.

F. S. K.—In applying gelatino-bromide emulsion to plain paper all that is requisite is to liquefy the gelatine, and, having poured it into a flat dish, float the paper upon it for a few seconds, and then suspend till dry. Where the troubles begin to appear is in the development, there being a difficulty in preventing the paper from becoming discoloured.

F. R. S.—To coat a glass with a layer of chloride of silver in collodion it is not necessary to make an emulsion of chloride of silver. The following is a very convenient way by which to prepare a surface of this kind, and it is one we frequently adopt:—Coat a plate with ordinary iodised collodion, and immerse it in the silver bath. After removal, wash it with water. To convert this iodised film into a chlorised one it is only requisite that the plate be immersed for a very short time in a solution of chlorine, which is made by putting a teaspoonful of ordinary chloride, or hypochlorite, of lime in a flat vessel containing a few ounces of water, and adding to it a few drops of hydrochloric acid, by which chlorine is rapidly disengaged, most of it, however, being absorbed by the water.

W. W.—The most effective experiment with nitrate of silver to exhibit during a public lecture is to procure three clear glass vessels, containing respectively solutions of nitrate of silver, caustic potash, and cyanide of potassium. These solutions will be all limpid and as colourless as water. Pour the caustic potash into the nitrate of silver; but before doing so explain what is to take place, viz., that the nitrate of silver is to be converted into the oxide of that metal, and that, as the oxide is a very dark brown powder insoluble in water, it is probable they will be able to see it. At this stage pour in the caustic potash, and the astonishment of the audience at seeing such a turbid, black, clotty fluid instantly formed will speedily manifest itself in hearty plaudits. After stirring the dark fluid with a glass rod, pour into it the contents of the third vessel, first of all explaining that cyanide of potassium is a solvent of oxide of silver and that the resulting solution will be limpid. When this has been effected immerse a clean strip of brass in the solution, and after a few seconds withdraw and rinse it in water, and show how the brass has now received a coating of pure metallic silver as if it had been electro-plated. The experiments here indicated are both pleasing and instructive. They are very easily performed, cannot possibly fail, and form an excellent accompaniment to such a lecture in connection with photography.

Portable Plate-Holder.—Mr. Stanley, of the Railway Approach, London Bridge, has sent us a portable plate-holder of a convenient form. One corner of the plate is "stepped" into a fixed piece, the opposite one being fixed by a piece acted on by a spring. It forms a very handy plate-holder, and differs with regard to construction from any we have previously seen.

Cabinet Portraits.—We have been favoured by Mr. H. C. Jennings, of Norwich, with specimens of his cabinet portraits, and, what we prize much, a fine portrait of the artist himself. We are always delighted to receive portraits of our correspondents, and already have a small collection to which we would like to make additions. Mr. Jennings's productions are excellent. This is especially the case as respects a portrait of Mr. Francis Sutton, which is a charming specimen of good photography.

South London Photographic Society.—The annual outdoor meeting of this Society took place on Saturday, the 28th ult., at Kingston. The day not being favourable very few cameras were at work. The members afterwards met at the house of Mr. Samuel Fry, Surbiton, who repeated his last year's entertainment. After dining together in Mr. Fry's garden studio the subsequent period was devoted to music, &c. Having spent a pleasant evening the members returned to town.

## METEOROLOGICAL REPORT,

*For two Weeks ending September 8, 1875.*

Observations taken at 406, Strand, by J. H. Steward, Optician.

These Observations are Taken at 8.30 a.m.

| August. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 26 | 30·01 | W | 62 | 65 | 72 | 62 | Dull |
| 27 | 30·15 | W | 59 | 62 | 75 | 57 | Dull |
| 28 | 30·12 | E | 57 | 60 | 69 | 59 | Dull |
| 30 | 30·12 | W | 55 | 56 | 72 | 53 | Cloudy |
| 31 | 30·03 | NW | 55 | 61 | 72 | 55 | Cloudy |
| Sept. | | | | | | | |
| 1 | 30·31 | W | 50 | 53 | — | 50 | Fine |
| 2 | 30·21 | W | 60 | 63 | 74 | 52 | Cloudy |
| 3 | 30·01 | W | 62 | 65 | 69 | 61 | Raining |
| 4 | 30·12 | W | 54 | 56 | 72 | 52 | Cloudy |
| 6 | 30·34 | NW | 55 | 56 | 75 | 54 | Foggy |
| 7 | 30·16 | SE | 57 | 60 | 78 | 55 | Dull |
| 8 | 29·94 | S | 61 | 65 | — | 58 | Dull |

CONTENTS

THE BRITISH

# JOURNAL OF PHOTOGRAPHY.

No. 802. Vol. XXII.—SEPTEMBER 17, 1875.

## ON THE SOLUBILITY OF PYROXYLINE.

In the course of some recent experiments with different samples of pyroxyline we found, as might have been expected, a great variety in the behaviour of many of them. This was more especially noticeable in connection with the solubility of the different specimens and the relative states of viscosity exhibited by collodions prepared with a given number of grains per ounce of each sample.

The latter effect did not appear to depend, as we should have expected, upon the quantity of cotton held in solution, as the most fluid collodion we made contained almost the largest quantity of pyroxyline of any of the samples. We found as a rule throughout the experiments that the most soluble cotton gave the most fluid collodion—not merely in equal proportions, for that we might naturally expect, but when the solvents held in solution as much as they would possibly take up of the cotton. The difference in solubility was very great in some cases, as we found it range from about seven and a-half grains to the ounce of solvents up to nearly twenty; the latter, however, was a very exceptional sample, and when dissolved to the extent of about eighteen grains gave a collodion little less fluid than the other sample at seven and a-half grains.

These results naturally set us thinking as to what might be the probable effect in actual practice of such peculiarities or properties in the cotton used for our collodion. In the ordinary wet or bath processes, except in so far as it affects the structural qualities of the film, the solubility of the pyroxyline is a matter of comparatively minor importance. It is only when we come to emulsion work that the real value of a suitable pyroxyline breaks upon us to its full extent; but even emulsion workers do not yet quite understand their own requirements in this direction, and are inclined, we think, to lay too great stress upon the importance of organic reactions. But is that all that is necessary to make a good collodion for emulsion work? We think not; for we have seen samples possessing all the physical properties of what has been called a "dense pyroxyline" which refused to work at all satisfactorily.

We will attempt to show, by means of a simple experiment, how the solubility of the cotton may affect most materially its working qualities. We took for comparison three samples of cotton, which dissolved respectively to the extent of seven and a-half, twelve, and twenty grains to the ounce of equal parts of ether and alcohol. The latter, or most soluble, which we had had on hand for some time, and which we had, after many trials, rejected as utterly useless for emulsion work, though it worked well for bath plates, dissolved perfectly in the ether-alcohol mixture, leaving no sediment and scarcely requiring any time to settle before use—a simple filtration through tow, to remove accidental impurities, such as dust or fragments of the seed husks, being amply sufficient. The other two samples, especially the second, gave a rather copious sediment, which took some time to settle.

We prepared from each sample a small quantity of collodion for comparison, using six grains of pyroxyline and twelve grains of commercial bromide of cadmium to the ounce. The different collodions were sensitised with an equal quantity of silver, and were throughout treated in identically the same manner. The resulting emulsions were essentially different in character and behaviour. No. 3 (the most soluble cotton) gave a dense, creamy film in about an hour after sensitising, and worked clean and rapidly, but refused to intensify; at the end of twenty-four hours it appeared to be no better; and in forty-eight hours was quite useless, though, upon testing, it was found to contain a slight excess of soluble bromide. The second emulsion appeared to sensitise more slowly, at the end of four hours giving a thick, but very translucent, film, showing that the whole of the bromide was not yet formed. It was better at the end of twelve hours; but it was over twenty-four before it was fully sensitised. It then gave a thick, creamy film, with the slightest possible tendency to structural markings, and worked admirably. The remaining emulsion behaved in a similar manner to the last, but sensitised with less rapidity, the operation not being complete until three days after sensitising. The film was then extremely dense, but too thick to flow properly, and required thinning with ether and alcohol before it could be used, when it gave results equal to No. 2.

The two last emulsions were apparently as good as ever at the end of a week, and were then poured out, washed, and redissolved. A fresh portion of No. 3 was sensitised and poured out ten hours after sensitising, giving then a clear, dense film of a most beautiful colour. When redissolved Nos. 1 and 2 gave the best results, the former, perhaps, intensifying with greater ease. No. 3 was quite useless; the film, though creamy looking, had a "dusty" appearance, and when viewed by transmitted light exhibited an entire absence of the well-known orange colour belonging to an emulsion in good working order. Development merely resulted in general fog, with scarcely the trace of an image. This result was rather curious, as immediately previous to pouring it out the emulsion was in good order as far as colour, appearance, and cleanness of working were concerned.

To test the correctness of our idea as to the cause of these different results, we prepared a second series of collodions from the same samples of pyroxyline, which we will call A, B, and C, in the order of their solubility. We used of A three and a-half, of B five, and of C twelve grains to the ounce, and in each case twelve grains of bromide of cadmium. They were sensitised as before with equal quantities of silver nitrate, and treated similarly throughout. There was now much less difference in the time required for sensitising, C being still the most rapid, though it was thirteen hours before the full effect was attained. At that time it worked, as in the previous experiment, clean and rapid, but with the advantage of acquiring with ease the requisite density. A and B were not ready for use until between sixteen and twenty-four hours after sensitising, when, upon trial, there was little to choose between them, both working satisfactorily.

At the end of four days the three emulsions were again tested, C giving the smoothest film, but being a trifle difficult to intensify. A and B were apparently in the same condition as when tried previously. They were then poured out, washed, and redissolved. After re-solution A was found to act most satisfactorily, being rapid and developing without veil or fog, giving without trouble any desired

density; B worked well, but was more sluggish in acquiring strength; while C, though clean and sensitive, refused to intensify even with silver. The emulsion was also different in appearance, having lost much of the deep orange colour it possessed before washing. With regard to the colour (we speak of the colour of the film by transmitted light) of A and B, scarcely distinguishable before washing, there was now a marked difference—the former being a deeper *red*, the latter having more of a *brown* tinge.

We mention the little details of colour because we attach great importance to colour as a test of the working qualities of a sensitive film, having always found the ruby tinge in connection with emulsions or films which were most easily intensified.

Having given as briefly as possible a description of our experiments we will proceed to apply to them our explanation of the difference in results. In the first place, we must consider the conditions under which a sensitive film is formed in the silver bath. We have a solution of pyroxyline and of certain salts which it is necessary to spread upon the plate as evenly as possible; provided the pyroxyline be well suited to the purpose no further difficulty need be experienced, the whole of the contents of the collodion being *in solution.*

In the case of an emulsion, however, we start under different circumstances; we have, in addition to the pyroxyline in solution, an insoluble substance, bromide of silver, held *in suspension.* This insoluble matter has the effect of thickening the emulsion and decreasing its fluidity, thus rendering it more difficult to produce an even film possessing any great density. The first and most obvious remedy would be to decrease the proportion of pyroxyline; but here, alas! we are met by another difficulty. The fineness of the deposit of silver bromide depends upon the viscidity of the medium in which it is held in suspension, and as the quantity of pyroxyline is decreased so, in proportion, is the bromide formed more rapidly and in a state of greater coarseness, until at last it becomes visibly granular. It is not, however, necessary to push the effect to that stage to make the emulsion useless. There are many instances in photography where colour and density depend almost entirely upon the fineness of the deposit; as an example we may mention the difference between an iron and a pyro. developed negative. We might adduce many instances to show that the same rule holds as regards the suspended bromide in an emulsion, but will only now refer back to the first series of experiments recorded above. It will there be noticed that in the thinnest and least viscid collodion (No. 3) the formation of the silver salt proceeded with great rapidity, the full effect being produced in a much shorter time than in the other two cases, the consequence being a film of bromide incapable from its coarseness of giving any density.

In the second series of experiments the same sample of pyroxyline used in double the proportion, in order to increase the power of suspension of the emulsion, gave very different results, thus proving that it was not altogether the lack of organic silver compounds which caused the want of density. Neither was the increased vigour of the image to be entirely ascribed to the greater thickness of the film arising from the double quantity of pyroxyline, as we have since proved by diluting the C emulsion to nearly one-half its original thickness, when it still produced images of much greater strength than the No. 3 emulsion of the first series.

The difference in the results produced by the same emulsion before and after washing and redissolving may, we think, be open to easy explanation. In our article, at page 411 of the present volume, upon the *Organic Reactions of Pyroxyline,* we pointed out the danger arising from the practice of washing the pellicle before the solvents have sufficiently evaporated. This is owing to the fact that during the time the water is penetrating into the solid portions of the emulsion the latter are exposed to the solvent action of a mixture of water, ether and alcohol. This mixture, while not possessing the same action as the undiluted solvents, will, at least, exercise some power over the pyroxyline, and especially upon the silver compounds upon which depends the density of the emulsion.

It is reasonable to suppose that the greater the solubility of the pyroxyline the greater would be the effect thus produced, and this supposition is fully borne out by our experiments; for, while the C emulsion worked well before washing and was entirely useless afterwards, the A, or least soluble sample, had undergone no change, and B held an intermediate position.

From these experiments the viscous nature of the collodion does not appear to depend upon the quantity but upon the nature of the pyroxyline it contains, different samples appearing to vary in value as much as do the bromides of ammonium, cadmium, &c. It is at first sight difficult to understand how with some samples of cotton three or four grains to the ounce prove sufficient, while with another two or three times that quantity are necessary to produce a collodion of the same degree of fluidity. If, however, we consider pyroxyline as a combination (in different proportions according to the circumstances of its manufacture) of two or more substances, one only of which gives the viscid nature to the collodion, the explanation is simple enough. Take, for instance, an ounce of a mixture of *equal parts* of gum arabic and sugar and two ounces of another mixture in the proportion of one of gum to three of sugar; let each be dissolved in an equal quantity of water, and, though previous to solution the weight is as two to one, the one containing the larger proportion of gum would certainly give the more viscid solution.

If our pyroxyline manufacturers would but note the remarks of Mr. Hardwich at page 423, and give us a cotton possessing the maximum of toughness compatible with fluidity and porosity, we should have fewer complaints of failure with emulsions.

## POLARISED LIGHT: ITS NATURE AND USES.

### IN THREE CHAPTERS.—CHAPTER II.

Having described the manner in which a ray of light is polarised by being transmitted through a rhomb of spar we now proceed to show in what manner polarisation is effected by reflection from a glass surface. The former is, as we have stated, the method universally employed in connection with the microscope; that about to be described is employed almost exclusively for public demonstrations or for the exhibition of objects on a scale of considerable magnitude.

A large portion of the light reflected from a number of shining bodies becomes polarised when the surfaces of such bodies have a certain relation to the eye of the observer with respect to the angle at which they are placed. For example: A shower of rain has recently fallen, and the street in front of our office is still wet. The granite blocks of which the street is formed are beginning to dry, but the black, earthy matter between the stones is still charged with water to such an extent that as we look down upon it from a distance of a few yards the light of the sky is reflected so well from these wet, muddy interstices as to present them as bright, luminous lines; yet we know that this light is polarised, and that by examining the street through any instrument which will remove the polarised light we shall see the street totally devoid of all glitter and sheen, with the granite stones of a light colour and the muddy surroundings quite black. Almost all reflecting surfaces, except the metals, polarise light. A piece of polished wood, varnished leather, japanned iron, painted timber, water, the human skin, nails and hair, glass, albumenised paper, and a number of other bodies of a similar nature also polarise light. It is with the polarising properties of glass we are to deal at present.

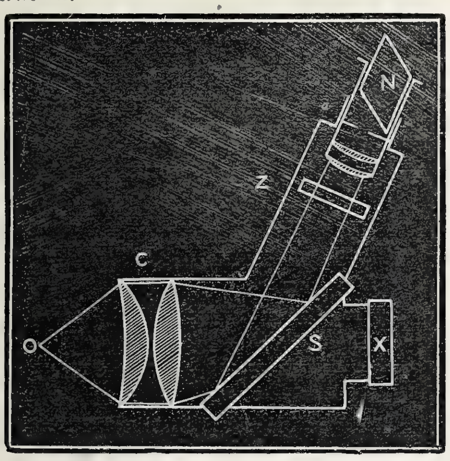
A single plate of glass when placed at an angle of 56° polarises light to a considerable extent. When it is backed by a second and similar plate a greater amount of the light is polarised. By the addition of a third plate still more of the light which would otherwise pass through the glasses is polarised. This goes on until about eight or nine plates have been employed, one in contiguity to the other, when the ray that falls upon this bundle of plates becomes entirely polarised.

But, if the light reflected from the surface of such a packet of glass be polarised, what becomes of the remainder of the light that has not been reflected, but which has managed to find its way to the last plate and to emerge from it? *That*, as we shall presently show, becomes polarised also, and in this bundle of plates of glass we have

the means of separating and securing the ordinary and extraordinary rays.

In order to secure the perfect polarisation of light from any object it is necessary that the polarising angle of that body shall have been ascertained, and the knowledge utilised with exactness in determining the position of such an object. The late Sir David Brewster is well known to have bestowed much care upon different kinds of glass, with a view to determine the polarising angle with greater precision than had previously been done. He discovered that when the tangent of the angle of incidence is equal to the refractive index of the medium upon the surface of which light is incident the reflected ray is completely polarised, its undulations taking place in one plane only. Plate glass has a refractive index of about 1·54, which is the tangent of an angle of 57°. To practically carry out this discovery let a bundle of eight or nine thin, well-polished plates of glass be prepared and placed at an angle of 57° towards the rays of light that are to fall upon it, when part of the light will be reflected from the surface and part will be transmitted. In either case polarisation will have been effected. That which is reflected is polarised by reflection; that which is transmitted is polarised by refraction—a term we employ with some degree of hesitation, seeing that it does not properly convey the true state of the matter.

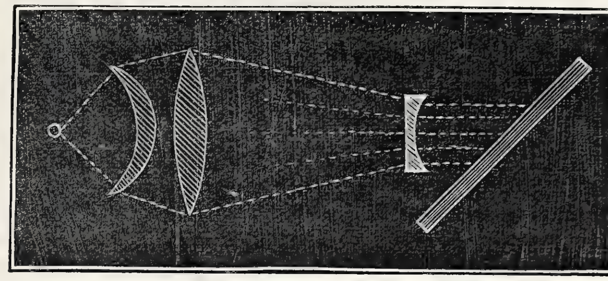
We now proceed to show in what manner the principles above stated are to be carried out in practice, and shall assume that a magic lantern is to be the medium through which an exhibition of polarised light and its effects is to be presented before a public assembly; and here we must have recourse to the diagrammatic mode of illustration.




In this diagram the light from any powerful luminous point, O—such as the lime, magnesium, or electric light—falls upon the condensers C, which may be of any dimensions, four inches being a useful size. At S is shown an aperture in the mounting in which is inserted the bundle of glass plates to which we have already directed attention. The light falling upon these plates is polarised and reflected up to Z, where there is a second aperture in which to insert the slide containing the object to be thrown upon a screen in a magnified form for public inspection. At N is shown a Nicol's prism just outside of the object glasses.

Previous to describing the object of thus placing the Nicol's prism we may direct attention to the manner in which the light falls upon the polariser S. It will be seen that the rays are convergent; and it requires little reasoning to show that, seeing the angle of polarisation is an exact one—which, in the case before us, is represented by the axial ray—it follows that all rays falling upon the polariser at an angle other than that of the axial one are not properly polarised; and that as the rays impinge upon the bundle of plates in a cone-like form the outer rays of that cone are very imperfectly polarised.

At the meeting of the British Association in 1866 we directed attention, in the course of a brief paper, to the fact just referred to, and pointed out a method by which we had been enabled to secure perfect polarisation of all the light transmitted through the condenser. This was effected by the interposition of a small plano-concave lens in the path of the converging beam of light, by which it was rendered parallel and fell in its entirety upon the glass plates at the true polarising angle, every ray being parallel to the axial ray. This is shown in the following diagram, in which all the rays are



utilised, and have their polarisation properly effected. The effect of this is to produce a marked increase in the amount of polarised light eventually projected on to the screen. As was shown at the time when this improvement was brought before the Physical Section of the British Association, the interposition of the flint concave tends to correct both the spherical and chromatic aberrations of the condensers, and in this way to produce increased brilliancy.

Looking at our first diagram it will be seen that the residuum of the reflected rays would pass out at X if the aperture were left unstopped. These rays would, as we have seen, be polarised as well as the others, but in quite the opposite direction. The one set of rays would be the ordinary, the other the extraordinary, ray. In one the vibrations would be vertical, in the other they would be horizontal. If a Nicol's prism were interposed in one set of emergent rays it would, if rotated, entirely stop the transmission of all light at two positions during its rotation around its axis. Observe that it does this only with polarised light; with ordinary light no darkness is produced. When used in this way and for this purpose a Nicol's prism is denominated an "analyser." When used for polarising the light in the first instance it is a "polariser;" and a *set* of polarising apparatus, such as that which accompanies every complete microscope, has two such prisms—one being used as a polariser, the other as an analyser, although both are of similar form and construction. As we have just shown, a bundle of plates of glass also serves as a polariser; there are many objections to its being used also as an analyser.

Professor Henry Morton, of Philadelphia, has given an account of the lantern employed by him in exhibiting the effects of polarised light. In it the condensers are so constructed as to cause the rays of light to emerge from them in a parallel form, by which they are all perfectly polarised, afterwards being collected and condensed by a third element in the condenser. There is no doubt whatever that this is a most effective method, but it necessitates the condensers having been specially constructed; whereas with the one designed by us any of the ordinary double condensers now applied to English lanterns can be utilised in a highly effective manner and at a very trivial increase in the price of the instrument.

## ON STUDIO PROPERTIES.

It is not of the qualities of the studio we intend to treat in the present article, although the title would seem to imply that something of that kind was intended. Those have been discussed already *ad nauseam* and from almost every conceivable point of view, with the result of leaving the question very much as it was at the beginning.

The fact is that most people have, or believe they have, a very good idea of the best form of studio for the class of work they intend to do; but it is not everyone who can really get his ideas on this subject fully carried out. There are many things which interfere with his plans—such as the space at his disposal, the only available quarter from which the principal light can be obtained, in many cases, also, pecuniary considerations coming in as a factor—all together combine to force him to erect, not exactly what he would like, but what he can accomplish. It is very much to the credit of a large number of photographers throughout the country that so

much excellent work is done in such unlikely places and under such unsuitable conditions.

It is not, however, of the studio itself that we desire to write, but of its contents, or what our transatlantic friends would call the "fixins," about which, we think, we may not unprofitably say a few words. The influence of custom or fashion, as is well known, seems to pervade all sublunary things, and especially does it prevail in matters photographic. Anyone who will take the trouble to examine the subject, and scrutinise the pictures produced during the last fifteen or twenty years, cannot fail to be struck with the fact that fashion has again and again passed over the productions of the fraternity like an irresistible wave, placing its stamp on nearly every picture, influencing and almost compelling into a particular direction the public taste, and, consequently, forcing the artist to work in that peculiar style.

An examination of pictures of what might be called the "early period" shows that the rage was then for painted backgrounds, and, generally speaking, the more convulsive the painting the better they were liked. A well-painted background, judiciously used, may, no doubt, be made very effective; but when the Lake of Como, lighted from the east, with a side slip lighted from the opposite direction, was made to do duty for a model standing on a Brussels carpet and lighted from a point different from both, it was too much for even uneducated human nature and had to be discarded. After that followed the less faulty solid furniture, which kept its ground for a considerable time, and we have no doubt would have maintained it still but for the fact that it became overdone, in too many cases the pictures being more like upholsterers' advertisements, with a figure thrown in as a kind of gauge by which the size of the articles might be ascertained.

This abuse of a really useful thing had the natural effect of bringing its use to an untimely end, and fashion hurried both photographers and photographed to the opposite extreme, where everything has been banished from the studio but the plain background; and we presume that this will continue to prevail till something altogether new shall, in its turn, sweep away plain backgrounds.

Now we confess to a liking for the plain background without any adjunct to interfere with the severe beauty of the lines of the figure, and we suppose that many whose artistic resources are not numerous find it much easier to make an artistic picture where there is nothing that they can misplace but the figure itself; but we feel that it is apt to become somewhat monotonous as we turn over page after page of the albums of our friends, and we confess to a desire for at least a shade of variety in the portraits we examine.

While we have no wish to return to the painted backgrounds of former days, we do desire that the dull uniformity too often prevalent should be broken up, and that by judicious shading, either on the background itself or by concentration of light in suitable positions, such variety of tints should be produced as the nature and position of the model seem to demand. Let a collection of high-class engravings be examined and it will be seen that the backgrounds have been made available as a means of enhancing the beauty of the works; and we are sure that if photographers generally would carefully study such engravings, with this object in view, some of them at least would give more attention to this phase of the art than they seem to do at present. While speaking of the background we may take the opportunity of saying that, no matter how well it may be shaded or graduated, a large amount of its finest effects will be lost if it be placed square with the camera. This fact, although well known, is, we have reason for stating, too much neglected; but a single trial will be amply convincing that there is a softness and beauty of texture produced when taken on an angle that is never present when it is square on.

Supposing the background to be all right, we think much benefit is derived from the judicious use of a few articles of furniture. Great care is, of course, required that everything introduced should be in keeping with the principal object, the figure. If, for example, a lady be seated with her arm leaning on a table it is of the utmost importance that the table should be at precisely the proper height. For this purpose it is absolutely necessary that some method of adjustment should be available, and probably the simplest is one we saw in use recently. It consisted of a pillar table made with a screw exactly like that of a piano stool, capable of being adjusted with the greatest nicety.

One of the most graceful poses in which a lady can be placed is that of standing in conjunction with a chair; and yet how frequently does the work of the poser result in utter failure, simply because the back of the chair is at such an elevation that by no conceivable method can he get artistic lines when his model leans on it! Now, by the simple contrivance of an adjustable back—one which can be raised and lowered at will—the difficulty instantly vanishes, and what before seemed impossible becomes a matter of the greatest simplicity.

The chair and table and one or two other articles of furniture may be regarded as the necessary constant fixtures of the studio; but there are many easily-extemporised appliances or properties which by a little ingenuity might be got up for temporary purposes, and which in dull times would do much to revive photographic interests, and ensure profit to the professional photographer.

In one establishment with which we are acquainted this idea is carried out to the fullest extent. The plain background with a very limited number of accessories is regarded as the standard style, but whenever business gets slack something new is at once introduced. Now it is a miniature stream of real water, which, by simple means, is made to run over a shingly bed and is crossed by a rustic bridge. By and by the bridge gives place to "stepping-stones," on which the daintily-slippered foot is shown to advantage. Anon is added a rustic spout, from which issues a stream of water "turned on" when required, and "the girl at the fountain" becomes the rage. Next, a cottage door with a stuffed canary in a cage hanging near; and when that ceases to draw something else equally attractive takes its place. A real boat, with real water, in which young ladies become "Grace Darlings," a full-rigged mast, on which boys turn "middies," &c., &c., follow each other in regular succession. The theory of the proprietor is that there is fashion in photography as in everything else, and that most of his *clientèle*, whenever they see a new arrangement, at once resolve to get photographed; and so he finds it to his interest to make "new arrangements" very frequently, much to his own pecuniary advantage and to the satisfaction of his visitors.

## TILLEY'S METHOD OF PRINTING-IN BACKGROUNDS.

When it was first announced that Mr. William Tilley, of Stafford, had discovered a method of producing combination photographs, which at that time he retained as a "secret process," several methods, hitherto unpublished, were given to the world by which the same end could be accomplished, among these being the ingenious and useful one of Mr. Werge. Owing to the fact of Mr. Tilley having secured his invention by patent its nature is now disclosed, and it proves to be different from the surmised methods.

Previous to giving the details of the process in the language of the patentee we present the following outline of it:—

Premising that a portrait negative is to be taken, and that a landscape or other background of a different character from that in the studio is to be associated with the portrait in the negative, the first operation consists in taking the portrait with a dark background. Now, while the sitter still retains his position, a second exposure is given to the negative, a white background being substituted for the dark one previously employed, and a transparency of the landscape inserted immediately in front of the sensitive plate. On the lens being uncapped the white background behind the sitter becomes impressed upon the sensitive plate except where prevented by intervening obstacles. These obstacles are, first, the sitter, and, next, the opaque parts of the transparency placed immediately in front of the plate. When the negative is subsequently developed it is evident that it will include both the sitter and whatever landscape or other subject was contained upon the transparency which was made to serve as a mask.

The method devised by Mr. Tilley is, doubtless, ingenious, and will take its place among the numerous other processes, published

or practised, for effecting the union of a landscape or "natural" background with a portrait taken in a studio. We now append the detailed account given in the specification by the inventor :—

My invention (says Mr. Tilley) has for its object the production of what are called "combination" photographs, whether negatives or positives, in which the sitter or principal object is photographed in combination with any required background, the portrait and background being produced without the rigid line separating the different parts of a combination photograph as ordinarily produced.

My invention also consists in producing photographic enlargements from combined negatives; and, further, in apparatus to be employed in carrying the said processes into effect.

I will describe my invention as applied to the production of a portrait in combination with a background. I take a photograph of the sitter in the usual way, except that the background behind the sitter is black or dark. As the background radiates no light the picture produced in the *camera obscura* is that of the sitter only, the parts of the sensitive plate surrounding the image of the sitter being left unimpressed, and capable of subsequently receiving any required luminous impression.

In order to produce the required background to the image of the sitter already impressed on the plate, I take a positive background on glass and place it as close as is convenient to the sensitive plate. The sitter still retaining his position, I mask or shut out by means of curtains, arranged and worked, preferably, as hereinafter described, the whole or as much as is practicable of the light falling on the sitter, and a white or light background is placed behind him. The light radiating from the white background and received by the lens in the *camera obscura* is thrown upon the positive background photograph and passes through it on to the sensitive surface, with which it is nearly in contact. A negative impression of the said background is thus produced around the image of the sitter, the said background producing no impression upon the image of the sitter already on the sensitive plate in consequence of the sitter being no longer illuminated. The sensitive plate, after having been thus exposed, is developed, treated, and printed from in the usual manner. Whether a positive or negative be taken in the camera a positive photographic background is employed.

The apparatus by which I produce the combination photograph is constructed as follows:—In the ordinary dark slide of the camera, and between the plane in which the sensitive surface on which the photograph is formed and the sliding shutter of the dark slide, I place a light hinged frame, the inner face of which, when shut down or turned aside, is parallel and very close to the sensitive surface; but when the said frame is opened into a position at right angles to that described, it lies nearly parallel on the side of the camera. By means of a winch or handle on the top of the dark slide the frame in question can be brought into either of the positions described. The said frame supports an inner frame or carrier capable of swivelling slightly therein, and the said inner frame or carrier contains the background photograph. In using the apparatus the sitter is illuminated and has a black background behind him, the frame carrying the background photograph being turned aside so as to allow the light of the lens to fall directly on the sensitive surface. When the image of the sitter has been sufficiently impressed he is thrown into darkness and a white background put behind him, and the photographic background in the hinged frame and carrier is turned down upon, and brought almost in contact with, the sensitive surface. The photographic background thereby becomes impressed on all parts of the plate not covered by the sitter. The hinged frame carrying the photographic background may be jointed to the side of the camera instead of being carried by the dark slide, but I prefer to combine it with the dark slide.

For enlargements, as well as for combination printing without enlargement, a separate mask and negative produced in the following way may be employed:—The arrangement of curtains for making the figure dark and also the white background hereinbefore referred to are used. On one plate I take the portrait with a white background, and on another plate I take a mask—that is, having darkened the sitter, I take another picture. Both pictures may be taken on a plate of the required size, which is afterwards divided. From the mask so taken I obtain by contact printing a reverse mask. This reverse has a transparent background with a dark portion having the figure of the sitter. The portrait and the reverse mask are fixed respectively to the two parts of a double or hinged box having holes in each hinged part or half somewhat larger than the plates of the portrait and mask. The portrait plate may be fixed in the box itself while the mask is carried by a carrier capable of being adjusted on the box, and fixed by means of screws and screw nuts in any required position at the back of the other half of the double or hinged box. By means of register pins the two parts of the box are made to close accurately upon one another. The double or hinged box being fixed in front of the enlarging lens one part is turned down or placed aside—that, for example, carrying the mask—while that carrying the portrait negative is copied on an enlarged scale on the sensitive surface. The other part of the box carrying the mask being raised or brought opposite the lens, and that carrying the portrait being turned down or aside, the background to be produced is placed as nearly as may be in contact with the sensitive surface, and, the mask being illuminated, the light radiated therefrom is directed by the lens through the superposed background, and the said background is printed, the mask preventing any printing upon the portrait already impressed upon the plate.

In this way an enlarged combination portrait to print from is produced on the sensitive surface; or an enlarged background from a small view or vignette may be obtained by placing the view or vignette in the hinged box with its varnished side presented to the varnished side of the mask, and exposing the same to light, the portrait and background being enlarged together. The portrait and mask may be used for combination printing without enlargement by photographing any background on the mask glass and printing on the prepared surface by separate operations, the mask being carefully adjusted to the prepared surface.

I prefer to exclude or shut off the light from the sitter, when necessary, by means of a curtain or curtains arranged and worked in the following manner:—I fix three horizontal parallel iron rods on the same level, the said rods extending from the top of the background to the part of the studio where the camera is situated. The two outer rods are fixed respectively at the top corner of the background, and the other rod midway between them. Over these rods a long black curtain is thrown, the middle part of which rests on the three rods described, the parts on either side the middle hanging down to the floor of the studio. When this curtain is, by a sliding motion, drawn over the sitter all, or nearly all, the top and side light is excluded or shut off, and the figure is consequently darkened and produces no impression on the sensitive plate. When the curtain is drawn from over the top and from the sides of the sitter towards the *camera obscura* the figure is illuminated. The required motions of the curtain may be effected by cords passing over pulleys, the ends of the cord hanging down sufficiently near the *camera obscura* to enable the operator to give them the required motions. In order to facilitate the motions of the curtains the part overhead may be supported upon one or more cross strips of wood sliding on the three rods described, the actuating cords being connected to the ends of these strips of wood.

When the portrait taken is a full-length one—that is, includes the feet of the sitter and the floor of the studio—the arrangements hereinbefore described with reference to the dark and light backgrounds should be extended to that of the floor of the studio which will be included in the photograph taken. For this purpose I place a black cloth or other dark material on the floor of the studio for the person to stand upon when the photograph with a black background is being taken; and when I obtain an impression of the photographic background in the slide of the camera I place white calico or other like material on the floor for the purpose of radiating sufficient light to impress the foreground on the sensitive plate, which in this case forms part of the photograph in the slide, and which I have hereinbefore called the "photographic background." As this has to be done without disturbing the sitter the calico or other material employed is in several pieces, so that it can be conveniently arranged round the sitter. The lower ends of the dark curtains require to be looped up a short distance so as to allow sufficient light to pass under them to illuminate the white material on the floor. By these arrangements a photographic background may be employed which includes, besides a background proper, the picture of a floor or foreground extending in front and at the sides of the sitter.

From the foregoing specification we have omitted all reference to the drawings of the apparatus devised by the patentee to enable him to carry out his idea practically. Of these drawings there are several; but as the specification, although open for examination in the Great Seal Office, has not yet been published, and is not likely to be for some time, we have given that portion most likely to interest photographers, reserving the description of the apparatus until, in due course of time, we shall have acquired facilities for so doing.

The definite "claim" made in connection with what we have here published is "the producing of combination photographs, whether

negative or positive—that is, photographs in which the sitter or principal object is photographed in combination with any required background by the processes or combination of processes hereinbefore described; that is to say, by photographing at one operation the sitter or principal object suitably illuminated, and in front of a dark background, and upon a dark floor, and by a second operation photographing upon the same sensitive surface the required background and foreground by the use of a transparent photograph brought in front of, and close to, the sensitive surface, the sitter or principal object retaining during the second operation the same position as was occupied during the first operation, but being thrown during the second operation into darkness by curtains or by otherwise excluding light, a white or light background being employed behind the sitter or object, and a white fabric or material on the floor, substantially as hereinbefore described."

We publish in another column a second communication from the pen of Mr. G. Watmough Webster, replying to Mr. Warnerke's article in our last week's issue, in the course of which Mr. Webster, somewhat unjustly, we think, charges the latter gentleman with misrepresenting facts "in a way the carelessness and impropriety of which are deserving of grave censure," and also implies that Mr. Warnerke has not used due care in conducting and recording his experiments. As regards the latter implication, Mr. Warnerke has been, we think, most precise in the description he has given of his method of making and using the substance the name of which appears to be so much in dispute. But, after all, if Mr. Webster be correct, and the substance be not methylal, it suffices that Mr. Warnerke's preparation is what is intended to be used in the developer, whether it be methylal or a mixture of half-a-dozen other things. Neither M. Alexandre nor Mr. Warnerke have claimed that it consists of pure methylal, strictly speaking, while Malaguti considers it a mixture variable in composition, containing methylic formiate and methylal. Fownes, on the other hand, describes under the name of "formo-methylal" a substance agreeing in every respect with the one in question, and which is said to consist of two equivalents of methylic ether and one of methylic aldehyde. So much for the name. The next point which Mr. Webster mentions is the purity of the wood spirit. We apprehend that the class of impurities found in the article as obtained direct from the distiller or from a respectable druggist would not be of a nature to *materially* alter the composition of the distillate. Much more likely to produce variations in the result is the method employed in the manufacture; and here we can trace one or two differences between the practice of Messrs. Warnerke and Webster. The latter finds fault with the former for substituting the water bath for a gas flame in his second experiments; but, a certain temperature being required, what matters it how it is produced? The reproduction of his previous results proves that the operation in both cases must have been carried out under similar conditions. The absence of traces of sulphuric acid in Mr. Warnerke's distillate appears to exercise Mr. Webster; but how any of the acid could be carried over at so low a temperature as 190° we cannot discover, unless Mr. Webster intends to imply that such contamination would be likely to occur through carelessness in manipulation. If so, the result proves otherwise. We must confess to being at a loss to understand Mr. Webster's meaning in the last paragraph but one, when he says—"I am of opinion that it matters little how the methylal is made; in any one observer's hands similar results would be obtained with entirely different samples." If that be Mr. Webster's opinion it probably accounts for his not having repeated *his* experiments before replying to Mr. Warnerke. In conclusion: we may say that, like Mr. Warnerke, upon reading Mr. Webster's previous communication we were of opinion that the experiments as recorded there were rather in favour of the new developer. Again: as Mr. Webster directly implies that he sets no value upon a bath, plates prepared in which develope in one operation to sufficient density, we fail to see upon what ground he condemns the plates developed with the new developer, because they require intensification, although, from the account of his experiments, the same detail is produced with a shorter exposure. We consider these remarks due to Mr. Warnerke, who is deserving of the thanks of photographers for the generous manner in which he has freely laid before the public his experiments in this direction.

We rejoice to learn, although we much regret the occasion, that a movement is being actively made by a few friends of the late Mr. John Glover, of Liverpool, to render assistance of a substantial kind to his widow and family, who, through the severe and long-continued illness of Mrs. Glover, are at present in exceedingly-reduced, if not actually destitute, circumstances. Mr. Glover's family are entitled to the kind consideration of photographers, for that gentleman was a careful and intelligent experimentalist in dry-plate photography; and by the results of his labours, fully and freely given to the world, the conditions under which bromide of silver was impressed with an image became better known than previously. It is now upwards of ten years since Mr. Glover was struck down by typhus fever, to which he rapidly succumbed at the early age of thirty-three, and since that time his widow and family have honourably maintained themselves; but serious ill health has suspended Mrs. Glover's energies with the distressing result to which we have already referred. A few friends present at the meeting of the British Association, to whom we showed a private letter describing Mrs. Glover's distressing circumstances, responded to our appeal with such cordial readiness as to have enabled us, after solicitations occupying merely a few minutes, to transmit to Liverpool, on behalf of the family, a sum sufficient for their immediate wants. A committee has been formed in Liverpool to take the necessary steps for aiding the family, and we need scarcely observe that this beneficent object has our best wishes for its success. Mr. J. A. Forrest, of Lime-street, Liverpool, is acting as treasurer, and we urge upon the generously-disposed members of our fraternity to do a genuine act of kindness by forwarding to Mr. Forrest such sums as they can conveniently afford to bestow on behalf of the bereaved family of our late warm-hearted and clear-headed brother. We also beg to direct attention to an announcement connected with this desirable object, which will be found in our advertising columns.

## EFFECT OF THE COLOURATION OF THE COLLODION FILM UPON ITS SENSITIVENESS TO RED LIGHT.

While making some experiments with roseine as an agent for staining the collodion film so as to prevent blurring, Captain Waterhouse, of Calcutta, found that on a stained film of this kind he obtained increased sensitiveness to the red rays. As one experiment scarcely affords sufficient data for the determination of a controverted matter of this kind, we trust that Captain Waterhouse will have repeated it, and also that other experimentalists will try the process. The communication of Captain Waterhouse is as follows:—

I have little photographic news to give you, beyond the fact that I have verified Dr. Vogel's discovery of the influence of certain dyes in increasing the sensitiveness of bromide of silver to the less refrangible rays of the spectrum, and as I have not seen it confirmed before, except partially by Becquerel, and it has been contested by such eminent workers as Monckhoven, Carey Lea, and Spiller, the verification, so far as it goes, may not be without value.

I have recently been working with the late Mr. Sutton's moist process, and found that a preliminary application of a ten-grain solution of tannin, followed by a good washing before the application of the glycerine-albumen preservative, increased the sensitiveness very considerably, but caused blurring of the image, from which the plates prepared without tannin had been quite free. In order to stop the blurring I coloured the glycerine and albumen mixture with a little ordinary roseine. (I do not know the exact proportion of dye used, but two drops of a tolerably strong alcoholic solution were added to about half-an-ounce of the glycerine and albumen. After development and fixing the films retained a strong pink tinge.) Having tried on several occasions without success to photograph the red end of the spectrum with stained films I did not anticipate any better results; but as I have at my disposal a fine single-prism spectroscope, giving a very brilliant and powerful spectrum, I thought of trying thin plates with it, and, having attached a suitable

camera, one of the plates was exposed for about a minute. On removing the plate from the dark slide a strong image of the blue and violet end of the spectrum was visible; but on applying the alkaline developer the green, yellow, and red gradually appeared, and I obtained a spectrum showing a strong action extending beyond D to about half-way between it and C, and though the C line was not visible there was faint action quite up to it.

A second experiment on one of the same plates with two minutes' exposure gave a similar result, and I obtained a spectrum showing strong action up to about half-way between C and D; then it suddenly fell off, but the C line was quite distinct, and visible action extended beyond C to B, and possibly to A. To ascertain if the effect was due to the dye I exposed a plate prepared at the same time as the others, but with unstained albumen and glycerine, the tannin wash being applied as before. Exposing for one minute no image was visible on the plate before development; but, on developing, a spectrum was obtained showing strong action up to about F, then it fell off and became gradually fainter till it stopped beyond D, about half-way between D and C, or at the point where strong action ceased on the stained plates. There can, therefore, I think, be no doubt of the action of the dye, and that Dr. Vogel is correct in his theory. I have not yet had time to make further experiment as to the action of other dyes, but shall do so and send you the results.

The subject is an interesting one, and, I think, may yield practical results which may be of use in copying coloured plans, &c.

## THE METHYLAL DEVELOPER.

Photography is far from being the only science in which cases occur where individual divergences of opinion to a most considerable extent exists upon subjects which it might at first be thought admitted of accurate demonstration. Time and increase in the number of observers will gradually elicit the truth; but, meanwhile, it behoves every one to be earnest and exact in seeking truth and avoiding erroneous recommendations. It was to be expected that methylal would share the fate of all new processes—first praise, then blame, ending in a monument or a sepulchre. The latter I confidently predict for methylal. I have given it a most careful and conscientious trial; yet, biased at the outset in its favour and taking great pains to ensure success, I have obtained results worthless in the extreme. There are few photographers in the kingdom to whom power to reduce the exposure would be more welcome than to myself, as I make a *specialité* in photographing babies and young children. Many is the forenoon in which I have taken half-a-dozen different babes belonging to as many fond mothers, but quickly though I work I would work, if possible, still more rapidly.

The subject of methylal has assumed, and properly, a chemically-technical aspect; and the least that can be expected from anyone having any chemical training is that he should deal with the subject in a scientific manner or not at all. I have endeavoured to put the readers of this Journal in possession of all the results of my experiments; and, although it is not to be thought for a moment that my remarks have been read by everyone, I do expect that when this subject is discussed they should either not be mentioned or be wholly read before being subjected to that criticism which in the interest of our art it is desirable every important subject should receive. It is unfortunate that Mr. Warnerke has broken the continuity of the doubtlessly laborious emulsion investigations in which he has already obtained such great results to undertake experiments and criticism of an imperfect and misleading nature.

In the interest of the readars of The British Journal of Photography I most emphatically protest against his statements with regard to my experiments. Contradicted, as they are, by the quotations he himself makes from my account, the latter must be read more fully to show how utterly Mr. Warnerke has misrepresented the facts, and in a way the carelessness and impropriety of which are deserving of grave censure. Personal details are tiresome to practical men; let it suffice, therefore, for me to say to those about to try the developer that I summed up my results as follows:—"It will thus be seen that, so far as my experience goes, it is dead against the new developer, which in no way surpasses what we have had in daily use for so many years." My opinion remains unaltered and unshaken; and, as within the time named by Mr. Warnerke as having been mainly devoted to emulsion work I have taken many thousand wet-plate negatives, there is, *a priori*, more reason for my opinion carrying weight than his.

I advise everyone who has the convenience to try the developer himself; it is soon done, and the results of a personal experiment will always be more satisfactory. But to those who cannot do so, and yet would wish to see further into the cause of the discrepancy between Mr. Warnerke and others' accounts, I will endeavour to make the various points raised more clearly understood.

With regard to the name of the substance, M. Alexandre, who introduced it to notice, spoke of his distillate containing "a large quantity of methylal," which is very different from calling the whole product methylal. Mr. Warnerke, in a sentence whose meaning is rather involved, cites Malaguti as calling it "methylal." But Malaguti did the opposite of this (page 135, vol. xxvii., *Ann. Ch. Pharm.)*; he distinctly states it is a *mixture*, variable in composition, containing methylic formiate *and* methylal.

I must again say that all published accounts of the manufacture of this developing agent indicate the use of the crude solution, and for that reason it must be considered better not to make pure methylal in endeavouring to repeat the favourable results of those who had published accounts of successful trials. M. Alexandre distilled over "a mild fire;" Mr. Warnerke, according to his first published account, over a "very slow fire." In his second publication he says he was induced "to repeat his experiments in order to test the correctness" of his first observations. In repeating experiments with such an object it is customary with chemists to perform the two series under precisely similar conditions; but, instead of doing that, the writer named, if his words are to bear their usual interpretation, has seen fit to alter the conditions entirely by distilling in a water-bath instead of over a naked fire—conditions under which, I need not remark, there would be reason to expect a marked difference of result.

Continuing this rather unusual mode of experimenting Mr. Warnerke, in his efforts to obtain a pure product, saw fit to make use of a sample of naphtha possessing a decided colour. I confess I find some difficulty in understanding why he permitted himself to use it—getting it fresh from the distiller, too. The latter must be a man in a very mild way of business, trusting much in the confiding nature of his customers, when he counts upon their receiving without a murmur, for the purpose of important experiments, such stuff as a second-rate drysalter would reject. When Mr. Warnerke states that he has not analysed his product to ascertain whether it is pure or not, one naturally wonders whether he could believe it possible to obtain a pure product from a naphtha of the colour and specific gravity stated, and what the sentence was written for if he did not believe it possible; and the more does one look for information seeing that his first product had an etherial smell, while pure methylal possesses an odour like acetic acid. Then his experience in obtaining a distillate free from sulphuric acid from a mixture in which it was contained in large proportions, and which in the progress of the experiments frothed up to more than three-fourths the capacity of the containing vessel—a retort, by the way, and not a long-necked flask—is highly interesting.

It is much to be regretted that these experiments were conducted, or their details published, with a haste that has left the author no time for the correction of those errors which, I am sure, he will be the first to discover himself. That he has been in such haste is evident from his next sentence, where, after showing that his distillate was free from sulphuric acid, he states that it was ignited, and says "the pale blue flame satisfied me of the absence of the methylic ether, which burns with a bright flame." He has forgotten that methylic ether is a permanent *gas*, and not a liquid; and, so far from burning with a "bright flame," when it does burn its flame is pale and feebly luminous!

Having cleared some of this useless matter away I may conclude with a brief look at the usual practice as regards development. I should consider it a truism to say that an over-exposed negative is thinner than one exposed the right time; and to those used to trying comparative experiments as to rapidity the varying density given by different developers is always a source of extra trouble, because the variation in the amount of detail is by no means to be ascertained at a glance, even when the negative is brought out of the dark room. The more the character of the negative under comparison varies as to intensity, colour, clearness, or fogginess in the shadows, and other trifling details, the more difficulty is there in coming to a quick conclusion as to their merits. I need, in this connection, do no more than refer to the most conflicting accounts given of the results of preliminary or subsequent exposure of plates to light, coloured or white, which to the present moment are not universally reconciled, and I have no doubt whatever in my own mind that the cause of this is indicated in the remarks I have just made. To those who have not tried exact comparative experiments, I say do try them at the earliest opportunity.

To sum up: I am of opinion that it matters little how the "methylal" is made; in any one observer's hands similar results would be obtained with entirely different samples. But mainly I

believe that, as I have previously briefly hinted, the state of the experimentalist's bath is the main cause of the different results obtained. My mentor's bath, disused for twelve months, was, in all probability, one which for sensitiveness I should consider useless; and, indeed, if with the conditions named it gave sufficient density at once, without intensifying, there is complete certainty that it was out of order for quick work.

I have six or seven ounces of the methylal left. I shall be happy to give half of it away—say in half-ounces—to anyone who wishes to experiment with it, on condition that he will try it and publish his results in The British Journal of Photography.

G. Watmough Webster, F.C.S.

[Some remarks on this article will be found among our sub-leaders. —Eds.]

## FOCUSSING WITH A PHOTOMICROGRAPHIC APPARATUS.

The difficulty of focussing an enlarged view of a microscopic object has been experienced by all who have tried this branch of photography. This difficulty does not arise from any inability to discern or appreciate minute differences in the quality of the definition, but from the more mechanical reason that, owing to the great length of camera required, it is almost impossible to reach with the arm the focussing-screw of the microscopic lens, and in a case where a very ample degree of enlargement is required to do so is *altogether* impossible.

One of the foremost of continental photomicrographers—Herr Carl Haack—has published in the *Correspondenz* the details of the method he employs in effecting the requisite adjustment of the focus; but we may observe that the apparatus is constructed expressly for camera work, and is not capable of being utilised in connection with the ordinary microscope.

An apparatus of the same nature as the lever fine adjustment of microscopes is attached to the front of the camera. An arm of brass sufficiently long to stand clear above the top of the camera is firmly attached to the face of the front, and at the lower end—that nearest the lens—is a pivot on which, as a fulcrum, a lever is free to move. The lower end of this lever is attached to the lens tube, which has a sliding motion into a jacket, the upper end pressing against the end of a screw that passes through the upper end of the supporting arm. This screw is rotated by means of a very long rod which passes over the top of the camera, and the handle of which is within reach of the operator's hand when he is engaged in the examination of the image upon the ground glass of the camera.

By rotating the rod the screw, which is connected with it by means of a universal joint, acts upon the long arm of the lever belonging to the fine adjustment, and in this way the lens may be moved in or out with great ease to the ten-thousandth part of an inch.

## ON THINGS IN GENERAL.

About in the world, roaming from studio to studio, skimming sheets of advertisements, reading pages of books and piles of periodicals, I see so much of error, exaggeration, fiction, misrepresentation, and quackery that I have determined to run a tilt among them, now helping honest stumblers and anon throwing to the ground those bold offenders who stop the way, hindering true progress, raising dust enough to hide the truth from weak wayfarers; and on friend and foe alike shall I keep watch and ward. I have no enmity either for patentees or process-mongers; but patents and processes without merit shall not pass by without a buffet if I have power to administer it.

And, in good faith, there are patents enough to be met with just now to keep everyone merry. How much obliged for the splendid opportunity for advertising, "free, gratis, and for nothing," must M. Lambert be to the Editors for the space, and to his detractors for the opportunity, afforded him. That he is a shrewd man and clever no one can deny who has seen the great beauty of his works artistic and the skilfulness of his work literary; and a student of either will have no doubt of his possession of various dodges, and his ability to make use of and to communicate them.

The latest aspirant for patent honours, as usual, is not to be allowed to have all his own way; for I see, after encomiastic consideration from the Editors, the question is raised the very next week as to whether any gain whatever is to arise from the use of "The Patent Concentrating Reversible Studio Window," for which is claimed "a greater perfection of modelling, showing sufficient point and solidity to render all retouching of high-lights * * * * unnecessary, * * * * giving that desirable roundness and vigour so indispensable to a good portrait," taking the sitter in "about half" the usual time! Therefore my own little box among the tiles lets in only half the light it would if the glass were taken out. No! no! Mr. Vanderweyde; you're wrong there; but about the modelling and solidity, the roundness and vigour—why, there are the journals before you to make your case out. But you are taking a proper step in naming a definite and uniform price.

My brethren will have a lively remembrance of a patent process for producing artistic work by mechanical means which was taken in hand by the jackalls when the lions had had their share and quarrelled—a process sold to one man in the morning for a couple of hundred pounds, and to another in the evening for as many dozen—the advertising and management of which was a masterpiece of craft and diplomacy unparalleled in the history of photography. How the big names were flaunted in our faces! how Mr. Sarony would open a place and work the thing himself if he did not get his hundreds of pounds for the sole right to work it in an hour's time! how Messrs. Robinson and Cherrill praised it, and paid, it was said, hundreds for it, and let the statement go uncontradicted!—is not all this fresh in the minds, and does not the process stink in the noses, of many? All you had to do was to soil your hands with pumice-stone and soot, and lo!—a picture; but more names than fingers were soiled, I think. 'Tis a pity the plan which enables Mr. Webster to keep his fingers "immaculate" could not have its advantages extended.

*Apropos* of clean fingers I can only say I should like to see Mr. Webster take his forty negatives and be digitally unstained after it. Has anyone ever tried to clean his fingers with potatoes? Every housewife knows that potato-water will take the tarnish off silver; why not off fingers? Perhaps Professor Stebbing intended to make the suggestion and forgot it when he wrote a good share of a column on new potatoes "all the year round, oh!" I could not see any other connection.

I am loth to leave the topic of silver without speaking of Captain Abney's new method of making mirrors. Instead of the old roundabout way of making a special solution, leaving it on the plate to take care of itself till finished, you have now only to get a dry plate, then expose to light, then develope, then intensify, then wash, then dry, then rub till bright, then make some cyanide of silver, then wash it, then dissolve it, then attach your plate to a wire and a silver sixpence to another, then fit up a Bunsen's (!) battery, and then connect it, and, presto! the thing is done before a day could well be half over. If any one wants to make a mirror and neither of these methods, the old or new, suit him, let him try some methylal; there is sure to be plenty to be had presently, and it should answer well. What a sensation it is causing! But I am afraid it will all come to nothing; for already the tide is turning. I have given the stuff a trial; but did not see much advantage in it. When will its name be settled? By turns it has been "methylic alcohol," "methylic ether," "methylal," and "methylal solution." Now, of all names in the world, the writer of *Foreign Notes and News* has it "methylic aldehyde!" Dr. Nicol has brought the matter to a climax by recommending sweet spirit of nitre. Fancy sending to your chemist's for a pennyworth of sweet nitre for a baby, and, please, some morphia, too, for a baby, not to dose it with, sir, only to develope it! I expect someone next week will recommend "Godfrey's cordial." I will give a personal guarantee that it is likely to answer as well as methylal or glycocine, gelatine, and the host of organics that have been exhumed from old files of the Journal of late. I am afraid the versatile Doctor is having some fun out of us in his last *Notes from the North*; for, after recommending us to paint the back as well as the front of an oil painting, "to strengthen and keep out the work," whatever that may be, he positively lauds the effect produced by an oil painting with water-colour figures introduced! I would as lief have a cheap German coloured lithograph.

German photographic literature, as exemplified by the English translation of Dr. Vogel's work on photography, has fared badly. I have not read his book in the original; but if, as is unlikely, it bears any resemblance to the translation it is simply atrocious. I see it announced by the publishers that a new edition, revised throughout, is in preparation. They ought to call in all the copies of the first they can lay their hands on, for the book is a disgrace to a firm which has published such splendid works as are to be had in the same series—King's "International Series of Scientific Works;" to name Tyndall's *Forms of Water*, Cook's *New Chemistry*, is enough. That my strictures may not be deemed too severe let me cull a few extracts. Within the first forty pages we come across "chloric gas," "iodide of bromium," and "salts of iodide." Page 41 has an explanation of a reaction too rich to transfer. A little further on, under the head of "Operation of Light" we find that chlorine is "developed from

chloride of lime," "bromine is an unpleasantly-smelling substance of a fluid nature," "iodine a black substance, also of a fluid nature, used for friction." We read of pungent, strong-smelling sulphuric acid. Our old friend "hypo." turns up as "fixing natrium" and "fixing sodium;" and so on, till one can stand it no longer. All this connected with the brilliant mind who discovered how to photograph any ray of the spectrum by tinting the collodion beforehand of the same colour! The method needs care, it is true—a proper depth of colour and, perhaps, a suitable collodion.

It is satisfactory to learn that the want of a suitable collodion is the chief cause of the Wothlytype process having been abandoned—I beg the gallant Colonel Wortley's pardon, I mean relegated—to those occasions only when "choicest" works are produced. There is a treat in store for the future when these hidden gems shall be made visible. The Colonel reminds one of Robin, of Egyptian Hall renown. You never could come round him, treat him as cunningly as you might when he had a pack of cards in his fingers; he always had something in reserve that brought down the house. The "Peripatetic," even, will have to give him up.

Why should the "Peripatetic Photographer" be so severe on the author of the articles on the Woodbury process? He has only done what he professed to do, being doubtless aware that "professions lavishly effused and parsimoniously verified are alike inconsistent with the precepts of innate rectitude and the practice of external policy;" he has put in a compact form the early methods used in Woodburytype. What though the process may not be used, and that its old working details are improved out of recollection? This philosopher without a soul should be above such gross materialism. He should be proud to contemplate the beauty and the grand simplicity of uselessness in the infant giant, and spend his grosser energies in the drudgery of carrying out the suggestive corruscations of genius, thrown off in their lighter moods by the pioneers of progress. Let him work, not talk; let him try Mr. Winstanley's latest invention ungrudgingly given to the world, free to all. Everyone knows the trouble of accumulations of ether and alcohol in the bath. "How shall he cure it?" a thousand voices exclaim. Let Mr. Winstanley speak for himself:—"Oil and fatty substances generally; phosphorus; vegeto-alkalies (what are they, I wonder?); resins; essential oils; gun-cotton. The addition of these substances it is but reasonable to suppose would absorb the ether and alcohol of the bath, leaving the solutions in a rectified condition!"

To obtain all these ingredients separately would entail some trouble; but it fortunately happens that the "oils and fatty substances generally," and "resin and essential oil" combined with alkali to neutralise acidity, will be obtained in a form at once elegant and portable in the shape of a cake of scented soap—say treble-scented old brown Windsor—one piece of which would suffice for a gallon of bath. If the full benefit were not then obtained the use of the phosphorus would be indicated. Here, again, a convenient substitute is at hand; the effect would be produced by emptying the contents of a box of wax vestas into the silver solution. The bath should then be "rectified." I purchased such a piece of soap with a view of using it as a detergent. Decomposition has, however, set in through putting it to such use, and any experiments in the way indicated are in consequence for a time delayed. I shall not patent this important modification of the original idea, but shall allow it, like a fly in amber, to become embedded in these columns for the admiration of future generations, who can point to the originality and versatility of a FREE LANCE.

## ROYAL CORNWALL POLYTECHNIC EXHIBITION.

REPORT OF THE JUDGES IN THE PHOTOGRAPHIC DEPARTMENT OF THE ROYAL CORNWALL POLYTECHNIC SOCIETY'S EXHIBITION, NOW OPEN AT FALMOUTH. BY THOMAS HART.

It is with feelings of great pleasure that the judges in this department report on the magnificent collection of photographs now exhibited, and to many of which they have had the honour of awarding medals. They regret they could not, by the rules of the Society, extend the prizes.

They would recommend the committee to revise the prize list for competitors before next year, in order more fully to meet the requirements of the rapid development of the art, as it is fast becoming not merely a chemical science but a real fine art, requiring the highest artistic culture, as evidenced in such works as those exhibited by Colonel Stuart Wortley, Messrs. George Nisbett, Chaffin and Sons, Robinson and Cherrill, A. and J. Bool, Lafosse, David Hedges, W. Nicholson, W. Brooks, Robert Crawshay, Garrett Cocking, and many others whose works are in the exhibition.

The first silver medal is awarded to Messrs. Chaffin and Sons, of Yeovil, for their *Group* (No. 749), taken direct, showing many high artistic qualities, and is the largest direct photograph (of figures) from one negative ever exhibited here. Messrs. Chaffin exhibit other works showing the same careful manipulation and good results.

The second silver medal is awarded to Mr. George Nisbett, of Bournemouth, for his *Portrait of a Young Lady* (No. 687). Mr. Nisbett exhibits ten photographic pictures, all showing that he possesses talents of a high order and has used them well. His picture, No. 682, *She Will Recover*, reminds one of the late Mr. O. G. Rejlander's exquisite art productions.

A special first silver medal is also awarded to Colonel Stuart Wortley for his collection of large studies of figures, which are very beautiful. They are powerful in light and shade, well graduated, and remind us of the works of Reubens, Rembrandt, and other old masters. He exhibits, also, a splendid collection of large instantaneous views (*What are the Wild Waves Saying?* being particularly successful), also the largest and best specimen of dry-plate photography we have ever seen.

A special first silver medal is awarded to Mr. David Hedges, of Lytham, for his fine studies of animals (a difficult branch of the art) most successfully treated, particularly the horses in case No 691.

The first-class silver medal is awarded to Mr. W. Nicholson, of Ventnor, for his *Bowchurch*, taken direct. It is a view well selected, broad in treatment, and shows that Mr. Nicholson has an eye for the beautiful.

The second silver medal is awarded to Messrs. Robinson and Cherrill, for their *Gleaner* (No. 728), showing all the characteristics of their work (for which they are so justly famous), but scarcely equal to former productions exhibited here by them—*Bringing Home the May*, for instance, of which we have a lively and pleasant recollection.

The first bronze medal is awarded to Mr. W. Brooks, of London, for his fine enlargement of trees (No. 734), evidencing that Mr. Brooks has an intense love of his art, and that he is an artist capable of producing eminently-beautiful work; the distances are atmospheric and well rendered.

A first bronze medal is awarded to Mr. George F. Dew, of Leamington, for his collection of beautiful landscapes, which are all well selected and cleverly manipulated. *Kenilworth* (No. 758) is very fine.

A special first bronze medal is awarded to Messrs. E. P. Lee and Co., of Cardiff, for their case of coloured ceramic photographs, which are gems of art.

A first bronze medal is awarded to Mr. J. M. Young, of Llandudno, for his well-lighted and beautifully-modelled portrait studies.

A first bronze medal (special) is awarded to Mr. B. Wyles, of Southport, for his instantaneous studies, entitled *Cloudland*, which are exceedingly artistic productions.

Others exhibiting, and whose works deserve especial notice, are Mr. Lafosse, who sends some very fine portraits—see No. 702; Mr. Garrett Cocking, who is a thorough artist in feeling, and a very clever manipulator—see No. 737, *Caller Herrin'*, and No. 739, *The Knight of the Bath*, &c. We hope to see more of Mr. Cocking's works.

Messrs. A. and J. Bool, of London, send some very fine landscapes. Their *Hampshire Lane* (No. 679) and *A Wayside Bridge* (No. 676), particularly the last-named, have a sheeny effect well rendered. Both are taken direct from nature. Mr. R. Mitchell, of Bolton, sends four excellent landscapes.

The amateur department is also well represented—first, by the splendid collection (of about thirty works, including landscapes and portraits) by Mr. Robert Crawshay, to whom is awarded a first silver medal for his large study of *Daisy* (No. 829.) No. 801, *Portrait of the Right Honourable the Marquis of Bute*, is also very fine, as are several others. Secondly, by Mr. W. A. Grant, who sends some splendid bits from Russian Lapland—see frame No. 831—many of which were taken at midnight.

## FOREIGN NOTES AND NEWS.

AN ELECTRIC PHOTOMETER.—DR. FLEITMANN ON ACCELERATED FILTRATION.

WE learn from the transactions of the *Verein für Gewerbefleiss* that Herr W. Siemens has been experimenting with a view to the construction of an electric photometer, and at a meeting of that Society

he exhibited an instrument which he hopes to elaborate still further into a useful, easily-used, registering photometer. He says of it:—"I have here endeavoured to utilise electricity, which so often steps in to help when other powers have failed, in the measurement of light. It is well known that selenium—an element which stands on the border land between the metals and the metalloids—possesses many remarkable physical properties, two of which seem to fit it specially as a suitable auxiliary in measuring light by electricity. If amorphous selenium heated to 80° or 100° C. be cooled down quickly the warm under-mass developes crystals which conduct electricity. In its amorphous state selenium is a non-conductor; and these crystals have the peculiar property of conducting electricity better when illuminated than in the dark—a property discovered and described by an Englishman, Lieutenant Sale. Sale also found that the conducting power increased with the increase of the strength of the illumination, so that it is influenced by the strongest lines of the spectrum in striking harmony with the omentum of the eye, which is also affected by these lines. It is these remarkable peculiarities of selenium which I have attempted to turn to account as a photometer. The first difficulties to be removed consisted partly of the smallness and inconstancy of the conducting power of the crystallised selenium, the weak and variable actions of the light, and partly of the disturbing influence of the heat rays. These were overcome by long heating of the amorphous mass to nearly fusing point, or by crystallising the molten mass slowly, thus producing a modification of the state of the crystallised selenium, in which it is a far better conductor, is far more readily influenced by light, is not perceptibly affected by warmth, and retains these properties with a certain degree of constancy. It also differs strikingly from the ordinary preparation in that its conducting power decreases with warming, as it does in metals, while in the latter it increases, as with metalloids. By filling the space between two, small flattened wire spirals with this coarsely-crystallised selenium placed between two leaves of mica I have been able to construct a photometrical apparatus which can receive from a Daniel's cell or a small thermo-electric electrometer a sufficient current by which to gauge the strength of weak light with adequate sharpness. The apparatus now shown is such an electric photometer. At the foot of a short extending tube is the selenium prepared as already described. The ends of the spiral wires are placed in connection by a Daniel's cell, and in conducting communication with the wire of a galvanometer. The needle is also moved. On the cover of the tube being removed and the light of a gas flame allowed to fall upon the selenium, as expected, the conducting power of the selenium is increased in proportion to the strength of the light, and, consequently, the variation of the needle of the galvanometer is also greater. Let the tube now be turned so that the light of a common candle shall fall upon it instead of that of the flame to be measured, and regulate the distance of the candle so that the variation of the needle shall still remain as before. The selenium being thus alternately illuminated by the flame to be measured and the candle their action is equal, and the actinic strength stands, consequently, in inverse proportion to their distance from the layer of selenium."

Dr. Fleitmann writes to the *Zeitschrift für Analytike Chemie* to recommend the use of two or more folds of paper in filtering when the saving of time is any object. He says:—"The theory of filtration—that trial of the chemist's patience—seems to me not to be so generally understood as it ought to be. Everyone is aware of the influence of pressure in quickening the operation of filtering; but there is another fact of greater importance which is not so well known. It is that the rapidity with which a fluid filters depends upon the thickness of the filter. Whenever I have asked any of my chemical friends whether a thick or a thin filter works quicker, the answer has been, almost without exception—'If the filters be equal in other respects, then manifestly the thin one.' Yet the contrary is really the case; a double filter filters almost twice as quickly as a single, and a three-fold faster than a double one. Ever since—some eighteen years ago—I observed this fact I have scarcely ever used a single one, and in the case of quantitive analysis I use an upper filter, of thin Swedish paper and an under one of thicker paper. The explanation of this, at first, astonishing fact may easily be found on a careful consideration of the details. The fluid to be filtered has evidently to move down the lining of the funnel, the sides of which slope before reaching the outlet tube, and in doing so encounters a strong resistance when the filter is too thin, as then the transverse section of the circular filtering canal is too narrow. The thicker the filter the wider, to a certain extent, is the canal in which the filtered fluid moves towards the foot of the funnel. As a voucher for the correctness of the foregoing statement I give an account of an experiment by which it was tested:—Three exactly similar funnels were obtained. The first was furnished with a single Swedish paper filter; the second with a similar filter, and under it, in addition, a layer of rather thicker paper was placed; the third was likewise furnished with a Swedish filter, but that had two underlying folds of thicker paper. Through these three filters the same fluid—diluted solution of chloride of iron tinged with ammonia—was passed, so that for the space of an hour all three funnels were constantly kept quite full. After the lapse of this time the quantities of fluid that had filtered through them was measured. Through the first funnel 278 cubic centimetres had filtered, through the second 560 cubic centimetres, and through the third 642 cubic centimetres. Still more striking is the difference, as easily explained, between the deposits which stop the pores of the filters for a certain depth; but the foregoing example with ordinary deposits will suffice."

## OUR CLUB.

### No. XII.—"In Memory of."

I have just returned from photographing the body of a little boy who had met with an accident and died yesterday. I don't like this class of work. It came like a shadow in the midst of our sunshine. Tom did not care for it any more than I, so we drew lots and I had to go.

The child's father was dead, and the widowed mother sat at the window vacantly staring out upon the green garden plot in front of her little cottage. Doubtless, in fancy, she was conning o'er the many happy days she had spent with her little boy on that same little patch of grass, which, with his companionship, was all the world she cared for; but darkness had fallen on her home and she could see nothing but gloom in the future, for her grief was fresh and heavy on her now.

As I entered the little gate on my professional mission she started from her seat and came and opened the door for me.

"I'm so glad you have come," she said, with a tear in her eye; "I thought you might not."

She took me into the room where the little body lay so pale and peaceful.

I asked to be left alone with my subject, because the lady had evidently some intention of staying, and I saw from the light in the room that I would have to move the body about considerably before I could bring the light properly on it. It was useless giving the mother in the freshness of her grief unnecessary pain, as this would have been certain to do, so she retired.

I stood by the bedside alone in the presence and stillness of death. Oh! it is such an oppressive stillness! When all expression has gone from the features that used to be lit up with smiles, and laughter, and joy—or, it may have been, clouded with little griefs and sorrows—and when the light of life has gone out, the stillness is very oppressive. The features look colder than marble, vacant, and expressionless. As I stood and gazed on that little figure clothed in white, with the flowers all strewn over the coverlet of the bed—a token of love—I could not help thinking on the unfinished story of the life which was here cut short. The mother's brain, which had been teeming with her darling's future, had been ruthlessly stayed in its picture-making—as step by step she guided him on to an honourable manhood, where he, amidst his fellows, was the pride of her grey hairs, for, though her hair was now black as the raven's back, through years to come in hope and fancy would she travel on; but hope was dead and her dreams had ended. The little soul, like the perfume of the flowers around that little head, had fled beyond the reach of human ken.

As I stood gazing steadfastly at the still, pale face I was tricked into the fancy that it moved, and all the features were lit up by a smile—a smile so sweet and childlike in its peacefulness that I felt sure the mother would have given her all to be possessed of such a picture of her boy.

After considerable arranging, as the light was weak and feeble in the room, I managed to get a negative in pose as lifelike as possible, so as to dispel the gloomier thoughts that looking at such a picture has the tendency to form, with due care I arranged the child's body upon the bed just as I had found it.

The mother was very grateful to me for coming; but her grief was beyond much speaking. She said that she had always intended to have the little boy's picture taken, but time had gone on and the opportunity had passed—it was so inconvenient to have a picture taken in a small country place like theirs. "We waited a more convenient season, you know, sir; and death always seems so distant until it comes and knocks at our own door. I think it must be a great boon to those who live in cities, for even a little picture of those we love is such a consolation when they are gone from us for ever."

I left the lady, and on my way home I felt pleased that I had taken this picture, although I must repeat that I don't like this class of work.

Mark Oute.

## CULLINGS

### From the Sixth Convention of the National Photographic Association of the United States.

On the Dignity of our Profession.—If I would talk upon anything, said Mr. Loomis, of Boston, it would be on the dignity of our profession. I say, the "dignity of our profession," but perhaps that remark may seem out of place. But I have many times, in regarding our fraternity, felt that there was something of a want of respect for it on the part of those who were its votaries—those who practise it. They have gone too much into the tricks of the trade, and by this I do not suppose that the members of our Association should be any more exempt from temptation than any other trades, but I have sometimes thought it was a profession and an art too good and too beautiful to be trifled with. I have been very sorry, indeed, to see it trifled with in the matter of competition and prices. I know it has been said, and truly, let us give as many as we can for the dollar, or as many as we can for five dollars. Let us popularise it. That is all right, so far as we can do so and maintain the accuracy and worth of the art, if I may so express it. But if we come down to auctioneers, every man bidding under every other man for the sake of the customer, and give him anything rather than something high, then it is, I think, that we are injuring our art. We have cut it down to a two-cent business too much. It ought to be elevated, and there is nothing in the world that will give it more respect than making it worth something, and charging for it. A man who has gone down from five to four dollars, and from four to three, and from three to two, in order to get a number of customers rather than the value has made a great mistake. They know it and acknowledge it, but they have not got the manliness to stop. You must not use the argument that some do—"I cannot make quite as good work as you do, and therefore I do not ask quite as much." There is another who says—"I have got an attic; it is up seven flights of stairs; I pay only fifty or twenty-five dollars a year for it; it does not require as much expense, consequently I will not charge as much." Better say—"If that man will distinguish himself up in the attic he can make even cripples go up after his work." People talk about getting into popular avenues and popular streets, and that there is no business on side streets. I tell you, gentlemen and ladies, that I thank heaven that we have been joined by them. That your work will make people step upstairs, right lively too, if you make it worth going up for. If you go on the principle of underbidding your neighbour in price, getting them to substitute for art-photography the apology for photography, you must expect the consequences—not only bankruptcy as an artist, but bankruptcy financially. It is easy to see the causes of failure, if you will only look at it right; and you will find, in your own locality, that the painstaking, persevering, high-toned man—the artist—is the one who is holding his practice and keeping his place. If you will look about you will find that the other places, seven-eighths if not nine-tenths of them, have changed hands once in two years, on an average—I may say, in some cases, once in six months. Now, I speak of this as an important thing. I do not suppose or expect we can close the matter up.

Retouching.—Mr. Bogardus said:—In regard to retouching I have just enough retouching done to take off the imperfections of the face, and try not to take off a perfection. Some lines require softening very much in the negative; they appear to be very harsh. Other lines require to be much stronger than you see them on the face. We soften hard lines, but never allow a feature to be taken out of the picture. I think pictures touched to the shape of an eggshell are miserable abortions, and never should be allowed to go out of the gallery. I have been asked a great many times how to do the clearer vignetting on my form of pictures that I take. I make a great many pictures with a dark background, and round the head there is a peculiarly-shaped shadow that cannot be vignetted without showing where that shadow comes. Your prints will be much finer without showing that sharp shadow round the head. Instead of presses made one inch and a-half thick, and some of them an inch and five-eighths, have them made always two and a-half or three inches deep. Your negative goes in here (indicating); your vignetting-paper out here (indicating). You can grade the paper off just as handsomely as you like it, and you have none of that egg-shaped line around the head. I do not say this from any egotism; I think it my duty. A great many of the pictures are spoiled because of this black, sharp line round the head—your vignetting does it. Put four pieces of wood on the top of your frame; it will bring your card off further from the negative, and you will do it.

Tact and Temper.—In reference to this matter Mr. Bogardus made the following remarks:—Now, about keeping your temper. A gentleman has just retired from the photographic business, in Boston, that I heard this anecdote about. I tell it because it will do you good and make you try to suit your customers regardless of the trouble. A gentleman came in with an 11 × 14 group of five. He said it was one of the most elegant groups he ever saw—a group of five on an 11 × 14 plate. The customer said—"We are not quite satisfied with this group; we wish you would take it over again." "Certainly. Come in by all means; come and sit again," said he; and the customer went out with the view of bringing his family again. This visiting photographer said—"Do you take as good a picture as that over again without charge?" "Why," said he, "that is the second one I have taken, and I am going to take it over again; that will satisfy my customer, and he will come again." That man has retired with $150,000. I would like to see any other photographer who has done it. How has he done it? He has done it by suiting his customers, regardless of trouble, expense, and time. Oftentimes it is hard work. I have to bite my lips many times to keep my temper down; but, I will tell you, it pays. Awhile ago, an old gentleman came to New York with a grandchild. They took the child to a photographer to have its picture taken—a man whose name they had heard mentioned a great deal. The child was scared and would not sit. They came back to the hotel and inquired where they should go. Another thing I will tell you. He had paid the price for a dozen cards, and the child would not sit. When he went down stairs he wanted his money back; they would not give it to him. He did not like that. He came, finally, to my place. He said the other place was like a circus—pay before you went in. They had come over to my place thinking they would try again to get the child's picture. Whether we were very busily employed that day or not I do not know; but we did get the child's picture right away. We kept it in good humour, and the child's picture was taken; and the old gentleman said to me he wanted a large picture of himself, saying—"I have been waiting a good many years to get good-looking, and I guess I had better have it taken now;" and he told me he would be very glad to have it done at once. I took down and showed him my life-size 17 × 20 crayons, and, before I had completed his work, got a bill of $1,005 from him. That was by just keeping in good humour; if I had not I never would have got a cent. He gave me his cheque for $1,005, and that was for taking babies. I know photographers do not like it; but, take the average through the year, we have less trouble with them than with the older ones. If you succeed in getting it the first, second, or third time you will make it; and it pays to take the babies. If you do not take the babies you do not get the mothers; and if you do not get the mothers you do not get the fathers. So you may make up your mind it pays to take the babies and keep in good humour, and do it all the time. There is another thing in regard to the elevation of the camera. There is a wonderful sight in that, particularly if you get a stout lady in front of your camera. Get your camera down. If you get up here (indicating) you get a broad shoulder and a shortened neck; if you get down here (indicating) you make your neck longer and get a pair of pretty broad shoulders. This has always been my experience. It may not be worth anything to tell you this; but, when I take a stout person's picture, particularly if it be a stout lady, I run the camera back; when I get a small one I run it up and make her a big one—she always likes it. That is exactly what they want.

# Correspondence.

## THE PHOTOGRAPHIC EXHIBITION.

*To the* Editors.

Gentlemen,—Permit me to call the attention of your readers to the advertisement, which appeared for the third time in your issue of the 10th inst., relating to the exhibition of the Photographic Society.

The Assistant Secretary will be prepared to receive pictures addressed to him at the Gallery, 5, Pall Mall East, from Monday, the 20th, to Thursday, the 23rd inst., both days inclusive.

The exhibition will be opened with a *conversazione* of members and their friends on Tuesday evening, September 28, and will remain open till the 20th November.

It is requested that all communications may be addressed to Mr. Edwin Cocking, Assistant Secretary, at the Gallery.—I am, yours, &c.,

R. J. Friswell, F.C.S., *Hon. Sec.*

9, *Conduit-street, W., September* 15, 1875.

## DISSOLVING OF THE NEGATIVE BY VARNISH.

*To the* Editors.

Gentlemen,—In the course of my working with emulsion plates, a few days ago, I encountered a difficulty I have not previously met with.

The emulsion used on that occasion was a "commercial sample," which yields me good negatives possessing a fair degree of sensitiveness along with other desirable qualities. The way in which I develope my plates is that recommended by you, viz., by applying a plain four-grain solution of pyrogallic acid, and after the image appears I add the ammonia and the bromide. This gives fine detail, without much intensity, which I get by adding a few drops of citro-nitrate of silver.

All this is plain sailing, but—alas! for those "buts"—there is a skeleton in my cupboard. On applying varnish—a "commercial sample" likewise—to my negatives they all disappear, leaving not a trace behind. In case others may have been annoyed by a similar experience I hasten to record for their benefit the means I adopted to effect a cure, for I have now effected a complete one.

Instead of reducing the strength of the varnish by adding water, as some have recommended, I interposed a pellicle between the collodion and the varnish so as to prevent the one from being acted on by the other. After trying various preparations, such as gelatine, gum water, albumen, and india-rubber, I have given the preference to a solution of Canadian balsam in benzole. I make this much thinner than ordinary varnish, and apply it to the plate while cold. It dries rapidly; after which I warm the plate and apply the spirit varnish in the usual way. Since I have adopted this method I have not lost a single negative.—I am, yours, &c., LOTHAIR.

*Camberwell, September* 15, 1875.

## ANSWERS TO CORRESPONDENTS.

*Correspondents should never write on both sides of the paper.*

J. B. C. FOX.—We shall "pass on" the query to Mr. Willis. We quite agree with you in your estimate of the beauty of platinum prints.

Q. C.—A cemented lens will work with greater rapidity than one the elementary constituents of which are not cemented. The cement—Canadian balsam is usually employed—diminishes the number of reflecting surfaces, and thus permits a greater number of rays to be transmitted.

J. M. TURNBULL.—We reserve your letter on the Vanderweyde patent until the specification is published. As the patentee is quite aware of what was published by Mr. Roe, the presumption is that he has introduced such distinctive features in his special claims as to render his patent a valid one; of this we shall all be better able to form an opinion when we know what *has* been patented.

SARTOR RESARTUS.—Phosphoric acid may be prepared by pouring four ounces of nitric acid and eight ounces of water on six drachms of phosphorus in a retort and applying heat. The distillation must be continued till the residue is of a syrupy consistence. This syrup is poured into a platinum vessel and heated to a dull red. It fuses and becomes concrete, on cooling, into a transparent mass, which is glacial phosphoric acid.

PYROXYLINE FROM GELATINE.—In reply to W. Knox, who inquired last week with regard to a sensitive description of pyroxyline stated to have been manufactured by Colonel Stuart Wortley, the latter gentleman says—"Many of my friends have had the formula; but I do not believe it is in commerce." It would be desirable if Colonel Wortley would *publish* the formula, so that all might participate in such advantages as, doubtless, accrue from using it.

IGNORANCE.—The object of adding acetate of soda to the toning bath is to check the solvent action the chloride of gold would otherwise exercise on the print, by which it would be greatly reduced in vigour. A portion of the alkali is converted into chloride, which enters into combination with the chloride of gold, forming a double salt. The acetic acid previously combined with the soda is liberated, but it has no injurious action. A good formula by which to prepare a toning bath is—

| | |
|---|---|
| Chloride of gold | 1 grain. |
| Acetate of soda | 30 grains. |
| Water | 8 ounces. |

Allow it to stand for twenty-four hours after mixing before being used.

CADMUS.—1. It is evident that the washings are not only a solution of nitrate of silver, but of some double salt. Chloride of soda will certainly precipitate silver as a chloride from a solution of the nitrate; but if cyanide of potassium were added to the nitrate solution cyanide of silver would be formed in the first instance, and this would immediately be dissolved in the remainder of the cyanide of potassium; nor would any precipitation take place by the addition of either chloride of sodium or cyanide of potassium. Try the effect of adding sulphide of potassium (liver of sulphur), and let us know the result.—2. The annual subscription to the London Photographic Society is one guinea, another guinea being required for entrance fee. The annual subscription to the South London Photographic Society is half-a-guinea, no entrance fee being required.—3. We shall be glad to see you during your proposed visit to London.

EXPERIMENTS WITH DEVELOPERS.—Mr. William Weston, of Pendlebury, has given us an account of some experiments recently tried by him in connection with iron developers, the special aim being to secure great rapidity of exposure. This rapidity he has obtained to such an extent as to be enabled to photograph a pigeon or a rook in its flight. Everything, in a case in which rapidity is concerned, depends upon the light and the lens, and when we find that our correspondent uses a lens an inch and five-eighths in diameter, with an equivalent focus of four and a-quarter inches, no stop being used, the feat described will not be considered extraordinary with a good light. The developer employed is a twenty-grain iron one, with thirty minims of formic acid, four minims of carbolic acid, and five minims of glacial acetic acid saturated with morphia. Scarcely so rapid in his hands, but giving greater intensity, is a thirty-grain iron solution to which are added ten minims of formic acid, and three of glycocoll, with a little over a minim of sweet spirits of nitre. If too much glycocoll be added he finds the film break up in drying. Mr. Weston suggests a pigment process in which the colouring matter shall be white, the picture being printed from a transparency and transferred to a plate of a black colour, a ferrotype plate being suggested. It may not be generally known that the late Mr. William Blair made pigment paper of this kind. The *modus operandi* was fully described by him in a pamphlet which was reviewed at the time in this Journal. Our correspondent finds great gain as respects rapidity by interposing a nine-inch solar condenser between the portrait lens he uses and the sensitive plate. He wishes Mr. G. W. Webster to inform him what is the *best* test for sulpurous acid gas, either when alone or mixed with other gases.

M. L.—It will be quite right if you add water to the saturated solution of silver until the argentometer indicates the strength required. The strength of a solution of iron may be ascertained in a similar manner; but as the degrees marked on the argentometer will not correctly indicate the strength of any other solution than that of nitrate of silver, it will be necessary to have a hydrometer specially graduated for the testing of the iron. A useful table might easily be constructed so as to show at a glance the strength of a solution of any of the salts employed in photography—such as protosulphate of iron or hyposulphite of soda—when an argentometer is immersed in such solution. We have carried out a similar idea with one of our thermometers, on which there are three scales placed side by side—those respectively known as "Fahrenheit," "Reaumur," and "Centigrade." If by the first of these a temperature of 140° is indicated, we see by referring to the scales placed along side of it that it equals 48° R. or 60° C.

BLISTERING OF GELATINE FILMS.—"AMATEUR."—The letter in our last week's issue, signed "Amateur," has been the occasion of our receiving other communications on the same subject. "Another Amateur," who encloses his card, says:—"I read 'Amateur's' note on gelatine emulsions with much interest, having been working diligently, but with little success, at this process for some months. It would, doubtless, be of interest and service to many of your readers if 'Amateur' would kindly give us the details of his procedure in making a gelatine emulsion."——Another correspondent, our respected friend Mr. Baynham Jones—in a note which he addresses to "Amateur," but which, for obvious reasons, we are unable to forward to that gentleman, and which we in this way bring under his notice—says:—"Referring to your letter in the last number of THE BRITISH JOURNAL OF PHOTOGRAPHY, you say you have 'found no limit to the amount of density in gelatine films.' I wish I could say the same. I get beautiful pictures in other respects, but I cannot intensify beyond a light drab, which is almost useless for printing purposes. If you will give me your formula I shall esteem it a very great favour. I am convinced that gelatine will supersede collodion if it can be reduced to anything like a certainty."——A third correspondent, Captain Banks, after referring to his experience with gelatine films, adds that he should feel greatly indebted to "Amateur" if the latter would furnish a formula by which intensity could be secured with alkaline development alone. We also join in the request. The way in which we ususlly intensify a gelatine negative is by the well-known acid-pyro. method. We develope with alkaline pyro. until every detail is well out and a moderate—although far from printing—density has been obtained, when we fix and, after washing, apply the acid pyro. and silver. The sensitiveness of some gelatine plates we have recently tried was very great; and, although gelatine may never supersede collodion, still it is desirable that the most perfect conditions under which it can be worked should be well understood. To this end we invite "Amateur" and others who have had experience with the gelatino-bromide process to publish as much information as they reasonably can for the public benefit

**Editorial Communications should be addressed to "THE EDITORS"—Advertisements and Business Letters to "THE PUBLISHER"—at the Offices, 2, York Street, Covent Garden, London, W.C.**

THE PHOTOGRAPHIC EXHIBITION.—We direct attention to a letter in another page from the Secretary of the London Photographic Society. Those intending to contribute must now lose no time in doing so, as all exhibits must be sent in between Monday morning and Thursday evening next.

MATT-SURFACED PHOTOGRAPHIC PAPER.—We have received from Mr. A. G. Clark, of Stretford, Manchester, samples of a new description of paper he has brought out. It is entitled "matt-surfaced," but, as this term has been employed to designate all kinds of paper devoid of gloss, we think it necessary to explain that the surface is "matt" in the sense of its being granular, like drawing-paper. For large portraits the effect of the matt ground is exceedingly good; and a peculiarity in the paper consists in its producing excellent proofs with a more than usually weak printing bath, and in not much over-printing or any over-toning.

## METEOROLOGICAL REPORT,

*For the Week ending September* 15, 1875.

Observations taken at 406, Strand, by J. H. STEWARD, Optician.

THESE OBSERVATIONS ARE TAKEN AT 8.30 A.M.

| Sept. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 10 | 29·96 | E | 53 | 56 | 65 | 54 | Dull |
| 11 | 30·13 | E | 54 | 57 | 65 | 54 | Dull |
| 12 | 30·33 | E | 60 | 62 | 72 | 56 | Dull |
| 14 | 30·20 | E | 60 | 63 | 72 | 59 | Hazy |
| 15 | 30·19 | E | 59 | 61 | — | 57 | Hazy |

CONTENTS.

# THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 803. Vol. XXII.—SEPTEMBER 24, 1875.


## THE RELATIVE PROPORTIONS OF BROMIDE AND PYROXYLINE IN EMULSIONS.

The above is a subject to which we were irresistibly drawn in the course of the experiments recorded last week on the *Solubility of Pyroxyline*, and, though at first sight it may, to many, appear a trivial matter, we shall endeavour to show that in many cases success in a great measure depends almost entirely on this point.

As we remarked in connection with our subject last week, it is only in emulsion photography that the importance of such apparently insignificant details begin to be realised, and we may, therefore, almost pass unnoticed the connection between bath plates and the subject under discussion. In such a case the collodion is fluid as oil when applied to the plate, forming an even and structureless coating before the formation of the sensitive haloids; the only danger to guard against is that of over-salting, which causes the formation of iodide and bromide of silver on the surface, instead of in the body of the film, in consequence of the superabundant salts bursting out from the overcharged pores.

In emulsion work the difficulty takes a different form, or, we might say, various forms. The requirements in a good emulsion are fluidity and freedom from structure, together with a sufficient body of suspended bromide of silver to form a fairly dense film. In order to secure to the full these advantages it is obviously necessary to observe a certain proportion between the solid constituents of the emulsion, as both the pyroxyline and the silver bromide tend to thicken and destroy its fluidity. If the former be in excess the result will be a thick, full-bodied film, but transparent and poor in appearance in consequence of the deficiency of bromide; while, if the latter be out of proportion, the resulting film will be thin and opaque, with a tendency to granularity. In preparing a washed emulsion it is specially important to observe the due relation between its solid constituents, but in this case quite irrespective of the fluent properties of the first emulsion, which is usually made considerably thicker than necessary in order to economise the solvents.

Bearing in mind our observations upon the varying solubility of different samples of pyroxyline, it will be obvious that it is impossible to lay down any fixed rule as to the exact proportion which should exist between the cotton and bromide in order to secure the best results. This is a matter which can only be decided by actual experiment with each individual sample; but as the conditions observed in the manufacture of pyroxyline for emulsion purposes are tolerably constant, and, moreover, as with such samples considerable latitude is permissible, the defect is not felt by the practised emulsion worker, or, at least, gives little trouble. But those who are unfortunately so placed as to be dependent for success upon pyroxyline of a doubtful or uncertain character, and who may be at the same time but little acquainted with emulsion practice, will feel the difficulty with double effect, and, being ignorant of the cause of their want of success, will in all probability end by condemning the process, when in many cases a different treatment of the pyroxyline would have set matters right at once. We do not go so far as to say that every sample of cotton may be made to give the best results when used for emulsion; but we do think, having found such to be the case with several samples we have tried, that any pyroxyline which is capable of producing good results when used with the bath may be made, under suitable circumstances, to work at least satisfactorily in emulsion.

The usual proportions recommended by the best known writers on the subject of emulsions vary from four and a-half to six grains of pyroxyline, and from eight to twelve grains of bromide to each ounce. It is a rather difficult matter to judge without previous calculation of the probable effect of a given quantity of bromide in any formula; we shall therefore be understood, in all cases, to refer to bromide of cadmium (or its equivalent in other bromides)—not the anhydrous or partially-effloresced salt, but the newly-crystallised product containing four equivalents of water. Ten grains of this salt are equivalent to an equal quantity of silver nitrate as nearly as possible.

In the experiments given last week it will be remembered that in the first three emulsions made we adhered to the proportions mentioned above, viz., six grains of pyroxyline to twelve of cadmium bromide. Two out of three gave satisfactory results, and it is noticeable that those two were made from samples of pyroxyline known as "suitable for emulsion purposes," while the third—which was a total failure—was supposed to be useless. In the second series of trials the proportions of the two constituents were very materially changed, and though the first two emulsions were but little altered in their behaviour, the third, and apparently useless, sample was so far improved as to be capable of producing satisfactory results when washed and organified in the usual way.

Feeling certain of the working qualities of the A and B samples of pyroxyline under almost any reasonable conditions, it was scarcely necessary to push the subject further in their case; but to try the effect of increasing the quantities of pyroxyline and silver in proportion to the bulk of the solvents we made the following experiment:—A collodion was made containing twelve grains of A cotton and thirty grains of cadmium bromide in two ounces of ether and alcohol. This was sensitised by the addition of thirty grains of silver nitrate in very fine powder, the mixture being well shaken at intervals during three days. Thirty grains more of bromide were then added (also in powder), and after four hours, with occasional agitation, the final addition was made. This consisted of thirty grains of silver dissolved by means of heat in fifteen minims of water, to which was then added one drachm of boiling alcohol. After the last addition the emulsion was well shaken for several minutes and set aside for twenty-four hours. It now contained in each ounce six grains of pyroxyline and thirty of silver, and, as might be supposed, was considerably too thick to be of any use. One half of it was then diluted with an equal quantity of ether and alcohol mixture, the remaining half being poured out to set in a 5 × 4 dish, washed, and dried. The resulting pellicle weighed thirty-seven grains, and was redissolved in two ounces of ether and alcohol. Of the two emulsions the unwashed one gave a very slightly dense film, but the other had the advantage as regards equality and freedom from structure. Compared with the A washed emulsion described last week the films had a shade more opacity, and the working properties were scarcely distinguishable one from the other, showing the latitude admissible in the treatment of a suitable cotton.

We next tried the effect of varying the proportions of the cotton and bromide, using the sample of cotton previously described as "C." We had succeeded in producing a workable emulsion, when washed and organified, by using twelve grains each of cotton and bromide, but failed with those proportions in making a satisfactory washed emulsion. The first task we undertook was to decide upon the minimum quantity of this cotton which would hold in suspension bromide sufficient to form a fairly dense film, and after one or two trials we concluded that it was not safe to venture below eight grains to the ounce, and even then the result was far from giving complete satisfaction. In that case we used, as before, twelve grains of bromide. It would be utterly useless to attempt to describe in detail the numerous modifications we made upon the formula; suffice it to say that the best result was given with twelve grains of cotton and fourteen of bromide to the ounce—a tolerably strong dose of both—but the emulsion was about as fluid as those previously mentioned.

Our next experiment will show better than any other explanation we could give the important part played by the viscous nature of the pyroxyline. An emulsion was made containing fifteen grains of C pyroxyline and twenty grains of cadmium bromide; this was sensitised by successive additions of silver nitrate until twenty grains had been employed. Forty-eight hours after sensitising it was diluted with an equal bulk of solvents and compared with the emulsion previously mentioned containing eight grains of cotton and twelve of bromide. The film produced by the new sample was apparently thinner than the other, as well as more transparent; but, though the emulsion in its diluted state contained half-a-grain less cotton and two grains less of bromide, the image obtained upon development was as dense again, and required a much shorter time to attain that result. This points distinctly to the conclusion that the nature of the image is dependent upon neither the quantities of bromide or pyroxyline in the emulsion, nor upon the apparent density of the film, but upon the state of fineness of the suspended bromide, which, in its turn, depends upon the proportions in which the salts and the pyroxyline are presented to one another during the operation of sensitising.

From what we have said it will be obvious that, to attain success with such a sample of pyroxyline in the washed emulsion process, it is only necessary to dissolve as much of the pyroxyline as will be conveniently held in solution by a given quantity of solvent, care being taken, at the same time, to preserve the necessary relation in the proportion of the salts; also, that with a pyroxyline so exceptionally soluble as the one we have been using it is of the highest importance to allow the whole of the solvents to evaporate before washing the pellicle. The quantity of water used in sensitising such an emulsion will generally be found sufficient to prevent the mass becoming "leathery," especially if it be not too thick; but in case that should be insufficient a few drops of glycerine added to each ounce will produce the desired effect—indeed, we prefer in all cases to use the glycerine, as it greatly facilitates the washing.

In conclusion: we may sum up our remarks by saying that, according to our belief and experience, there need be less complaint about the want of a suitable pyroxyline for emulsion, and especially washed emulsion, work if the nature of the pyroxyline were more completely studied; that the nature of the image is dependent mainly upon the state of division in which the silver bromide is formed; that the latter is formed in a greater or less degree of fineness according to the viscosity of the collodion, and that the desired viscous properties are possessed in the highest degree by the less soluble kinds of pyroxyline. Finally: a certain relation should exist between the proportions of pyroxyline and silver bromide, varying with the solubility of different samples of pyroxyline; and if the latter exceed the proportion an over-transparent film is the result, while as the proportion of bromide is raised so does the opacity increase.

## THE "PROMENADE" PORTRAIT.

The visit of a leading western photographer to England has afforded us an opportunity of seeing some of the "styles" more recently adopted in America. Mr. J. A. Todd, of Sacramento, California, who is at present making himself acquainted with what is transpiring among the studios of this country, has left with us some examples of the "promenade" portrait, which appears to be in general use on the other side of the Atlantic, although it has not yet been introduced here.

The size of the "promenade" portrait is somewhat peculiar, the mounting card being $7\frac{1}{4} \times 4\frac{1}{4}$ inches. In these dimensions it coincides with the ordinary "cabinet" portrait in width, which, however, it exceeds in length by nearly an inch. The proportions are such as to be very suitable for a full-length figure unattended by many studio accessories; for it will be readily perceived that on account of the narrowness of the picture there is not much room afforded for the display of "properties."

In March last we gave an account of a portrait possessing certain dimensions which was at that time being introduced by Mr. Blanchard through the agency of Messrs. Marion and Co., and which had been designated the "boudoir" portrait. The proportions of the "boudoir" and of the "promenade" are almost similar, the *picture* of the former ($7\frac{1}{2} \times 4\frac{3}{4}$) being nearly the same size as the *mount* of the latter, which is $7\frac{1}{4} \times 4\frac{1}{4}$ inches. The mount of the "boudoir" is about one inch, both ways, in excess of that of the promenade—$8 \times 5$ inches.

What we have previously said, therefore, relative to the similarity of these proportions to those adopted by Reynolds, Gainsborough, Lawrence, and the old portraitists for their full-length pictures of ladies applies with equal force to the smaller edition of the "boudoir" since brought out in America under a different, if equally non-descriptive, appellation. It is undoubtedly much more suitable for displaying to advantage a fine full-length figure than the "cabinet" form, which for this purpose is too square, and in consequence requires more accessories to balance the figure than good taste sometimes permits, and which too often distract the eye.

We are unable to say in what manner the public have received the "boudoir" portrait; but from the fact that we very seldom meet with them even among the specimens of novelties exhibited in the saloons and in the show-cases of professional photographers, and have not yet seen any in the possession of private individuals, we imagine they have not yet attained any general favour.

The "promenade" portraits of Mr. Todd, instead of being square (we refer to the print, not to the mount), have the tops curved in dome-like fashion. They are singularly fine examples of photographic art, being pure in the lights and deep and transparent in the blacks. This is the characteristic of a variety of portraits, other than the "promenade," which we have seen by this Sacramento artist. Of these a "direct" portrait of a young lady in bridal costume, $18 \times 15$ inches, shows in what manner a difficult class of subject may be successfully treated. The dress, which is white, is perfectly rendered in all the detail, while the face is equally perfect, showing no indications of having had to suffer in the exposure necessary to do justice to the white bridal attire.

The collodion with which these portraits, as well as a very fine $16 \times 12$ view of the State Capitol of California, were taken was prepared by Mr. Todd himself, and consists of the following:—

| | |
|---|---|
| Iodide of ammonia | 5 grains. |
| Bromide of potassium | $2\frac{1}{2}$ ,, |
| Anthony's cotton | 5 ,, |
| Equal parts of ether and absolute alcohol | 1 ounce. |

Describing the merits of this collodion in a letter to Mr. E. L. Wilson, of Philadelphia, Mr. Todd says:—"For indoor or outdoor work, for all seasons, hot or cold, for taking blooded horses when flies are bothersome, or for crying babies that have nothing in the world to bother them—indeed, for every kind of work—I have never found its equal." The developer used is a simple one of a solution of protosulphate of iron with a little acetic acid and enough of alcohol to make it flow evenly should it not do so.

With respect to the strength of the developer, Mr. Todd has never been able to distinguish any difference between a strong and a weak one except in the time required to complete the reaction, provided a proper amount of light and shade has first been secured and a sufficient exposure allowed. The nitrate bath, originally one of forty grains to the ounce, is now much weaker through its having

been much used; it is kept in an acid state by the addition of nitric acid.

We have given these details on account of certain peculiarities in the picture of the State Capitol. Although taken in bright sunshine there is a total freedom from harshness or strong contrasts, this being the more remarkable when we consider that at Sacramento the clear blue sky is scarcely ever obscured by a cloud during three-fourths of the year; and those who have had occasion to photograph architecture under a bright sun and a clear blue sky know the great difficulty of producing a soft, harmonious picture under such circumstances. It was to the ability displayed in this direction that much of the fame so worthily achieved by Mr. S. Bourne, formerly of Simla, was due; and it says much for the skill of the artist, as well as for the excellence of the appliances, when such a picture as that just described was obtained at one o'clock in the afternoon, with the thermometer nearly up to 100° in the shade.

## POLARISED LIGHT: ITS NATURE AND USES.

### IN THREE CHAPTERS.—CHAPTER III.

Light, we have shown, can be polarised either by transmission through a crystal of calcite or Iceland spar, or by reflection from a bundle of thin glass plates. There are other means by which this end may also be effected, but those mentioned are usually employed in ordinary practice.

When a beam of polarised light is examined by an analyser or a Nicol's prism, if the latter be rotated there will be found two stages in course of that revolution in which blackness results, the light being entirely cut off. This was shown very effectively by Mr. Spottiswoode, at the lecture to which reference has been made, by means of two thin, long-shaped plates of tourmalin, which were mounted as a magic-lantern slide in such a manner as to revolve in opposite directions. When the two were placed as if they formed one and the same block of crystal no colour was apparent except the natural colour of the tourmalin; but when by rotation one had been moved through a right angle, then darkness supervened. By continuing the rotation the light gradually returned until it had attained its maximum brightness.

As the same phenomenon occurs with the appliances for polarising we have described, we give an account of the phenomenon in the language of Mr. Spottiswoode, which we extract from an admirable little work by that gentleman, *On the Polarisation of Light*, one of the "Nature Series" of scientific manuals published by Messrs. Macmillan and Co. Referring to the phenomenon to which we have just been alluding, Mr. Spottiswoode says:—

"The same alternation of brightness and extinction will continue for every right angle through which the moving plate is turned. Now it is to be observed that this alternation depends only upon the angle through which one of the crystals has been turned, or, as it is usually stated, upon the relative angular position of the two crystals. Either of them may be turned, and in either direction, and the same sequence of effect will always be produced. But if the pair of plates be turned round bodily together no change in the brightness of the light will be made. It follows, therefore, that a ray of ordinary light possesses the same properties all round; or, as it may be described in more technical language, a ray of ordinary light is symmetrical in respect of its properties about its own direction. On the other hand, a ray of light after traversing a plate of tourmalin has properties similar, it is true, on sides or in directions diametrically opposite to each other, but dissimilar on intermediate sides or directions. The properties in question vary, in fact, from one angular direction to another, and pass through all their phases, or an entire period, in every angle of 180°. This directional character of the properties of the ray, on account of its analogy (rather loose, perhaps) to the directional character of a magnet or electric current, suggested the idea of polarity; and hence the condition in which the ray was found to be was called 'polarisation.'"

Among the most attractive demonstrations that can be made by the agency of polarised light—if not, indeed, the most beautiful experiments in physical science—is the formation and exhibition of crystals. The salts used in photography furnish the most effective of these. Having arranged the lantern so as to throw a suitable disc on a screen let a clean plate of glass be fitted in the place in which the slides are inserted. Previous, however, to inserting this plate of glass let it be well wetted over with a solution of nitrate of silver (mere moistening of the glass will be insufficient), and, after being slightly warmed, let the plate be placed in the lantern. Now let "all eyes be directed" to the screen, when, slowly growing from one side, an intensely luminous tree upon a dark ground will be seen, for the analysing prism must previously have been adjusted so as to cut off the light. The stem, branches, and leaves are not only seen growing, and with an intense degree of luminousness, but in varied and gorgeous colours. The size of the crystals formed in this manner, as well as their general characteristics, depend to a great extent upon the degree of temperature to which the glass plate has been subjected.

To such an extent is this correct that we may state that we have in our possession seven slides prepared from one solution—an alcoholic solution of hippuric acid—no two of which are alike, being different in the nature, shape, size, and colours of the crystals. Some of these are arborescent, others stellate, some acicular, and others circular, like an open umbrella or flower. In respect of colours, some are of a uniform mauve, others pink, green, and yellow. The influence of temperature on the character of the crystals obtained by evaporating a solution of sulphate of copper has been noted by several writers. Gallic acid and tannin form beautiful crystallisations, while salicine yields crystals of such magnificence that no collection of polariscope objects can be considered complete when this crystal is absent. Acetate of soda, as well as the carbonate of this substance, well repay the labour of crystallising them. But, in our estimation, it is reserved for bromide of cadmium to occupy the foremost place among the numerous photographic preparations that may be shown in the lantern polariscope. The lustrous beauty of iodide of cadmium is recognised by every photographer who has seen the salt. Having dissolved some of it we crystallised it in the certain expectation of forming a fine subject for examination by polarised light, but were much disappointed; it was "dead" and opaque. But when a similar solution of the bromide was employed, the brilliancy and variegated form of the crystallisation called forth a burst of admiration from the few who were present at the time.

To ensure a slide of this kind remaining good, care must be taken to prevent the total desiccation of the salt. When it is anhydrous its polarising powers cease. We cemented a cover over some fine crystals of bromide of cadmium by means of Canadian balsam, but in less than a week their beauty had departed. Castor oil is said to be the best cementing substance for this salt. One of these slides now before us, when shown on the screen, presents the appearance of a bank of very green moss, from which rises yellow, blue, red, and violet flowers and shrubs. There are many salts in daily use the examination of which will prove a source of interest to the photographer, among which we may mention both the red and yellow prussiate of potash; the nitrates of barytes, ammonia, uranium, potash, and soda; the oxalates of chromium, potash, and soda; the carbonates of lime, potash, and soda; bichromate and chlorate of potash; tartaric, gallic, tannic, citric, and oxalic acids; alum, and many others, of which we have not yet been able to complete an inventory.

By polarised light the presence of a foreign substance may be detected which, owing to its minuteness, would fail to be discovered in any other way. We recollect very well when some gum-gallic plates were handed to us for examination by an experienced friend. The faults of these plates were spots, the nature or origin of which could not be discovered. Even microscopic examination had been resorted to without avail. At length we tried the effect of an examination by polarised light, when the cause of the spots was instantly found to be extremely minute atoms of gallic acid. By ordinary light in the microscope they defied discovery; by polarised light they became revealed like so many diamonds and rubies glittering on a perfectly dark ground. The cause having thus been discovered an efficient remedy for the evil followed as a matter of course.

The clear blue sky at an angle of about 45° polarises light. Let that portion of the heavens be scanned through a Nicol's prism;

upon rotating it the sky will become darkened at every semi-revolution. If a small, light, and nearly-invisible cloud pass across the sky during the examination a beautiful sight is presented; for, as the cloud does not polarise light, it becomes alternately very white and luminous or so dim as to be almost invisible as the prism is rotated, the former effect being due to the darkening of the blue sky.

We have said that water and polished surfaces polarise light at a certain angle. The leaves of some trees do so in a most marked manner. This knowledge may sometimes be turned to good account; for if, owing to the reflection from the trees, a snowy, patchy effect is produced in a photograph this defect is cured by placing a Nicol's prism either in the lens tube or outside the stop, according to the class of lens that is used.

By the same means it is not only possible, but easy, to photograph an object under water—the bottom of a shallow lake, for example; for as the prism destroys most of the light reflected from the surface of the water the "eye of the camera" is thus enabled to see objects resting on the bottom. Even a considerable ripple often interposes no obstacle to the eye of a spectator who looks down into the water through a prism of this kind. We invariably carry in our pocket a small prism not larger than the cork of a two-ounce phial, and we strongly advise our readers to do likewise. Their cost is now exceedingly small; their utility most incontestable.

## GELATINE.

Albumen and silver—long the mainstay in the production of prints on paper—are slowly but surely giving way to gelatine and chromium. We have a vivid recollection of the rapidity with which albumen sprang into favour, and our readers are aware how firmly it has for many years maintained its position. Of the many causes which have contributed to the popularity of albumen not the least important is the fact that, although a very complicated compound, it is one of nature's own manufacture, and therefore, to a large extent at least, constant and invariably reliable. With gelatine this is not the case, as, although it may be obtained from almost all animal tissue, it nowhere exists in nature ready formed, and consequently is a result certain—we might almost say in some cases uncertain—manufacturing processes, and so liable to possess varied properties, incident, no doubt, both on the source from which it is produced and the method adopted in its formation.

To this variation in the qualities of gelatine we believe is to be attributed, in a large measure at least, the variable results and the difficulties experienced by different operators in working the various photographic processes into which it has recently been introduced, and we fear such difficulties are likely to continue until the makers can introduce uniformity into the mode of its manufacture. It may be said that gelatine is gelatine no matter how it may have been produced, and to a certain extent this is true; but it is most certainly not so in respect to nearly all the qualities that give it a claim to a place in the laboratory of the photographer. As an example of the differences met with in this substance we may say that of three samples we have recently been using—all obtained from good sources, and so far as appearance went equally good in quality—one required to be used to the extent of thirty per cent. more in quantity before yielding a jelly of the same firmness as the others, and another became almost insoluble and "livery" immediately on the addition of an alkaline bichromate.

Gelatine, as is well known, is met with in commerce under the two designations of "gelatine" and "glue." Generally speaking, the boundary line between the two is well marked; but in some cases, especially in that produced by foreign makers, there is a little difficulty in assigning to some samples their proper position. The object of the glue-maker is to produce an article possessing the greatest possible amount of adhesive power—that indefinite thing called "strength"—and if it have that his customers are not in the habit of caring what may be its composition; while the object of the maker of gelatine is, or should be, to produce an article as nearly as possible free from everything but gelatine itself.

Glue, then, is simply an impure gelatine, generally produced by the action of water at a high temperature on all sorts of skins on which the maker can lay his hands. It usually contains much colouring matter—often sulphate of zinc, and frequently common salt. It is not, however, with glue that we have at present to do; and so we shall confine our remarks to some of the properties of gelatine proper, and to a description of the method adopted for its manufacture by one of the largest producers in this country.

The gelatine of commerce is generally met with either in shreds or in sheets of about eight or ten inches by three inches, and varies from almost colourless to a rather deep straw tint. That produced by the French makers is generally of a paler colour than that of the English; but, for purely photographic purposes, our experiments lead us to believe that the latter is much to be preferred. We are informed that the French article is to a large extent produced from the more gelatinous fishes; and, if that be true, it may possibly account for the difference undoubtedly existing between the two.

The properties which give gelatine its value from a photographic point of view are mainly three in number—its insolubility in cold water, its solubility in hot water, and its readily being rendered insoluble by the action of certain salts or acids. A somewhat subsidiary property, that of becoming hardened, although not insoluble, by several of the alums—especially roche and chrome—is also of considerable value. Of course it will be readily understood that such properties are only possessed in the highest degree by gelatine in a state of purity, and that they are largely influenced by even a very small quantity of some of the foreign matter that occasionally, both by accident and design, finds its way into the substance. With respect to one of the samples already mentioned as having been experimented with, we find that if it be simply soaked in the ordinary way, and then dissolved by heat, it invariably becomes insoluble on the addition of potassium or ammonium bichromate. If, however, it be soaked in a number of changes of water, and well squeezed after each change, no such action takes place, proving that the partial decomposition of the chromium salt had been brought about by the presence of some soluble impurity in the gelatine—a metallic salt, in all probability, as a current of sulphuretted hydrogen passed through the washing water gives a copious black precipitate. It is, of course, easy for the manufacturer to guard against the addition by design of any impurity; but he should be equally careful that nothing finds its way in by accident. The water used, especially, should be examined carefully, as unless quite pure the finished article may become seriously deteriorated for photographic purposes. Both lime and alum are used in the preparation of the skins, and unless they are thoroughly removed by sufficient washing they will certainly exercise an injurious influence on the gelatine prepared for the purposes of photography.

In enumerating the properties which make gelatine useful in photography we might have added a fourth, namely, that of a solution—fluid while hot, becoming solid when cold. Now, this is a property which it very readily loses; and we have reason to believe that to the forgetfulness of this fact is due many of the failures occasionally met with by inexperienced operators. If gelatine be frequently heated, especially to a very high temperature, it gradually ceases to solidify on cooling, and that just in proportion to the frequency of heating and the height of the temperature to which it has been subjected. It should never, therefore, be raised to a temperature higher than is required for solution. Most of the acids, also, if boiled with gelatine destroy its power to solidify, and form it into a syrupy solution, which makes a handy paste or gum for ordinary purposes; in fact, we are aware that very large quantities of the so-called "mucilage" sold in bottles is simply a cheap glue that has been so treated.

In our next number we shall give a description of the whole process of manufacture, &c., of perfectly pure gelatine.

Some months ago we noticed the recommendation of M. Jaubert, of Marseilles, to add sugar in small quantity to the collodion, for the purpose of preserving the plate moist for a considerable time after

leaving the bath. Though M. Jaubert stated that he had followed this plan for six years with success, we were at the time rather dubious of the advantages gained. The first question naturally to be asked was—"Does it affect the bath?" to which the reply was entirely satisfactory. We now hear, however, from a friend who has tried the method that such is not the case; that though for some time after using the sugared collodion his bath and other chemicals continued to work well, yet, at length, things began to go wrong, and, finally, the bath was thoroughly out of order, refusing to be doctored into a proper state by any of the usual means. This result is not in any way to be wondered at when we consider the general behaviour of silver nitrate in the presence of saccharine matter. Though pure cane-sugar has, *per se*, but little organic affinity for silver, we have only to turn to the circumstances under which it is found in the bath. In combination with alcohol, ether, acetic or other acid, nitrate of silver and other salts, is it to be wondered at if the comparatively harmless sugar be converted by fermentation or other decomposition into a very dangerous substance? Many of the derivatives of alcohol as well as some forms of saccharine matter act as very powerful reducing agents in the presence of silver—so much so, indeed, that by simply mixing a solution of silver nitrate with any of the substances in question the most perfect mirrors may be produced by the deposition upon a suitable glass surface of the minute particles of metallic silver. It is noticeable that in the case of the bath spoken of above a copious deposit of black mud was found in the vessel, the sides of which were coated with a film of the same colour.

## ON WASHED EMULSIONS.

Though I have for some time, from various reasons, been unable to contribute to the pages of The British Journal of Photography, I have still watched with the liveliest interest the numerous articles which have lately appeared on the subject of washed emulsions. When I last had the pleasure of writing in these columns upon this subject the washed emulsion process, if not in embryo, was at least in a very incipient stage; since that time, however, very great advances have been made, not only in the working of the original process, but various modifications and additions have been made, materially increasing its practical value.

This process, more than all others, requires a special, or rather suitable, cotton, failing which it is impossible to secure the best results. The first improvement was made by Captain Fox, who recommended the addition of an oleate for the purpose of conferring greater rapidity and density on the emulsion. This addition I have tried, and in the absence of a really good sample of pyroxyline I have found it of the greatest use.

The next improvement—or I should, perhaps, say modification (for it is still a moot point whether it is an improvement or not)—is that of Mr. M. Carey Lea, which consists in the use of an iodide and the action of an organifier upon the pellicle before it is washed. I have tried this method in several different forms, and at first experienced considerable difficulty in obtaining a good emulsion when iodide was used, but eventually succeeded in getting into the right groove. My earliest experience with the new form of emulsion was so favourable that I at first believed it to exceed the old form in sensitiveness; but after further experiments I came to the conclusion that the increase in rapidity was only imaginary. The effect of the iodide appears to be the production of a picture which "comes out" with greater vigour under the action of alkaline development, and intensifies with greater ease than is the case with bromide alone. This at first sight gives the idea of greater sensitiveness; but closer trial, in my hands at least, has failed to prove any such advantage.

I have also tried Mr. Lea's method of applying the organifier to the emulsion previous to washing in connection with bromide alone, and here I find it a decided advantage, more especially with those descriptions of pyroxyline which lack density when treated in the ordinary way. The bromide emulsion, as compared with the bromo-iodised with the same treatment, I have found in all cases to have the advantage as regards rapidity, but to a very slight extent. The latter form produces films which develope with greater vigour under the first action of the alkaline pyro., and, moreover, appear to acquire density with a less alkaline developer than the bromide plates. This feature is difficult of explanation, as the action of the alkaline developer upon iodide of silver alone is almost *nil*.

The appearance of the dried emulsion prepared by Mr. Lea's method with free silver is very far from prepossessing when either tannin or gallic acid enters into the composition of the organifier, as, take what precautions you may in the way of acidifying the preservative and the washing water, it is impossible to prevent discolouration of the pellicle. This discolouration does not, however, appear to immediately affect the working qualities of the pellicle, but it holds out a very fair expectation of instability in the finished emulsion.

As regards the preparation of the pellicle, whether silver or soluble bromide be in excess, I must take objection to the remarks of "A. P. C.," the London correspondent of the New York *Photographic Times*. At page 437 that gentleman directs that the emulsion should be "poured into a broad, flat dish, so that ten ounces shall cover about two square feet." Now, though undoubtedly the thinner the layer of emulsion the more easily it is washed free of soluble matter, still I think this is an unnecessary extension of the surface it is made to cover. I have always found that by allowing about ten square inches to each ounce of emulsion I secure a thorough elimination of the soluble salts in a short space of time, and that without any needless occupation of space. He then proceeds to say that the emulsion is to be kept in agitation until it becomes gelatinous throughout, and that when it "breaks into clots on moving it about" the water is to be poured on and allowed to remain for about an hour.

This too early washing I have always found to be most mischievous in its results, and even in my first contribution on the subject I urged the necessity for allowing the pellicle to become thoroughly firm before the addition of the water. More recently I am glad to see that the Editors have spoken of the importance attached to the observation of this rule on account of the partial solution of the semi-dried pellicle. In addition to that, however, the sensitive material, if not allowed to "set" fully, is so tender and difficult to handle that a still greater loss arises from the escape of minute detached particles. To obviate this difficulty I recommended the addition of glycerine to the emulsion previous to pouring out, and if that be done the pellicle may be left much longer than is really necessary without any fear of its becoming too dry or horny.

Another point to which the Editors have called attention is the danger of using hot water in washing the pellicle. This course I recommended originally for the sake of securing effectual washing in a minimum of time, but I have since had reason to abandon the practice. I have made the experiment of subjecting the halves of an emulsion which had been poured out—the one to the action of hot, the other to that of cold, water. The difference between the two halves when dried and redissolved was astounding; for, while the one worked as well as could be desired, the other which had received the hot water treatment gave weak, thin images of no value whatever.

As regards the keeping qualities of the washed emulsion I have, so far, found it not only keep well but to improve with age after solution. It is certainly much better a fortnight after solution than it is at first; but how far that improvement may continue it is difficult to say.

A very useful application of the washed emulsion lies in its use wet, either in the studio or out of doors. The exposure is extremely short, and the plates develope with great rapidity, readily acquiring any degree of strength—surpassing in these respects the dry plates prepared from the same emulsion. The development may be effected by means either of pyro. or iron, both giving fine results. If the former be used it may be in connection with an organifier of albumen rendered faintly alkaline, which may or may not be washed off before development. If iron be employed the organifier, or at least its alkalinity, had better be dispensed with, the plate being soaked in plain water to get rid of the ether and alcohol, and the development commenced by flooding it with a fifteen-grain solution of silver rendered slightly acid with acetic acid, which is then followed by any of the usual iron developers.

Thanks to the researches of Captain Fox, Messrs. Lea, Stillman, H. Cooper, and others, the washed emulsion process is now able to take its stand as one of the best processes of the present time, and will, I have no doubt, sooner or later drive the bath out of the field, even for wet plates.

W. B. Bolton.

## COLLODION FOR THE DRY PROCESSES.

In my last communication on *Collodion for the Dry Processes* the word "nitrate" was by mistake inserted for "nitrite." The action of potash upon the collodion produces a small quantity of nitrite of potash. How far this would affect the result in the dry processes I

am unable to say; but as regards the ordinary wet process I did not find the addition of nitrite of silver to the bath to increase the sensitiveness. Taking the crystallised nitrite of silver and dissolving it in an absolutely neutral bath the development was more easy and rapid, with solarisation of the high lights; but there was no appreciable difference in the time of exposure required.

In adding potash the quantity used should be very small, otherwise the collodion will be quite limpid like water, and the iodide of silver will burst out in flakes upon the surface of the film.

Your article *On the Solubility of Pyroxyline* in the last number of the Journal is one of great interest, and I feel sure that with perseverance the collodion you desire will soon be obtained. For the benefit of those who would like to assist in experimenting I offer the following suggestions in addition to those contained in my last:—

1. The number of grains of pyroxyline required to produce a given amount of fluidity of collodion will vary with the temperature of the acids. If used *cold* two grains to the ounce of solvents will be sufficient; but this preparation will not flow easily upon the glass.

2. It will also vary with the relative quantities of the sulphuric and nitric acids. The more sulphuric and the less nitric acid, the greater the number of grains which will dissolve without too much glutinosity.

3. Linen fibre produces a more limpid collodion than cotton; and old linen, nearly rotten, more so than new linen. I gave up the use of linen in the manufacture of pyroxyline because I found that the plain collodion made from linen did not keep well in hot climates like India and China.

As far as my experience goes nothing is so good for making pyroxyline as the best American cotton; and by varying the proportions of the acids, the amount of water, and the temperature, almost any desired effect can be obtained. It must be borne in mind that the action of the sulphuric acid is to give toughness and organic reactions; whilst a high temperature produces fluidity of collodion and breaks up the structure of the cotton, making it short and powdery. *Water* in the nitro-sulphuric acid has the same tendency, but with this difference—that the organic reactions are injured if the addition of the water be carried too far. A minute quantity of potash in the collodion is suggested as a ready means of producing an effect similar to that of keeping after iodising. It may be useful in those cases where the film is too contractile and repels water.

Pure nitrate of potash is the best source of the nitric acid for a beginner. Pulverise the nitre and dissolve it in the oil of vitriol, adding water as required. F. Hardwich.

## GELATINO-BROMIDE PROCESS.

As you desire it I have much pleasure in giving the particulars of my mode of working this process, which, however, does not differ much in its general details from what has already been published on the subject.

I have tried almost every modification that I could think of, including the addition of an iodide and a chloride and an excess of silver with *aqua regia* added both before and after the dialysing of the emulsion; and, although I obtained some very good results with several of them, yet I find that a plain bromised emulsion, with a slight excess of bromide, is as sensitive and more certain in its results than any of the others, while at the same time it is simpler to make. I never make more than an ounce of emulsion at a time, and proceed as follows:—

Soak fifteen grains of Nelson's patent opaque gelatine in a two-ounce bottle of water for several hours (other kinds of gelatine may answer equally well, but, having found this sort quite satisfactory, I never cared to try any other). I then pour off the water and add two drachms of distilled water and eighteen grains of bromide of potassium, and place the bottle in hot water until the contents are dissolved. While this is doing I dissolve twenty-five grains of nitrate of silver in two more drachms of distilled water, then take all into the dark room, and add the silver to the bromised gelatine gradually, shaking well between each addition. I then add a drachm or two of *methylated* spirit and sufficient water to make up the whole quantity to one ounce. The emulsion then consists of—

| | | |
|---|---|---|
| Gelatine | 15 grains. | One ounce of emulsion. |
| Nitrate of silver | 25 ,, | |
| Bromide of potassium | 18 ,, | |
| Methylated spirit | 1 drachm. | |
| Distilled water | 7 drachms. | |

I allow it to rest till next day, and then dialyse it for four or five hours according to the directions given by Mr. King, to whom I think all gelatine workers should be greatly obliged for informing them of this simple method of perfecting the emulsion. It is then ready for coating the plates, and should be used as soon as possible, although in cold weather I have repeatedly found it keep good for a fortnight.

No substratum should of course be used, but the plates should be well cleaned, particularly at the edges, or the emulsion will shrink away from them. I guide the emulsion over the plates with a glass rod, and place them on a level shelf to dry, covered by a board placed about an inch above them to keep off all falling dust. They will be dry next day, and present a beautiful, glossy, and transparent appearance like opal glass.

Should the plates take a long time to dry either the room is too damp or the emulsion has begun to decompose, in which case blisters will be almost sure to occur during development; but if all have gone right the plates will stand any amount of washing and rough treatment without showing any tendency to blister.

Before development the plates should be laid in a tray of water for a minute or two to soften the film, and if the exposure have been correctly timed sufficient printing density can be obtained with the strong alkaline developer alone; but from over-exposure or other causes it is sometimes necessary to intensify, which I prefer doing (after fixing) by immersing the plate in a solution of bichloride of mercury until the picture appear distinctly as a positive by reflected light. I then wash and apply ordinary alkaline developer without the bromide, when almost any shade from a rich brown to a jet black may be obtained. The acid pyro. method also answers well, but as the acid tends to blister these films it is better to allow the plate to dry thoroughly and then merely wet the film before applying the intensifier; no blistering will then occur.

The proportions above given suit best, I think, for ordinary work; but, if more density at the expense of a longer exposure be desired, any amount may be obtained with the alkaline developer alone by slightly increasing the quantity of the bromide so as to have a greater excess of it in the emulsion.

With Kennett's pellicle I have never been able to obtain proper density, but it is more sensitive; the films prepared by it look cold and are more opaque than those prepared as above described. If the above emulsion could be obtained in the pellicle form collodion might retire from the field. At least, so far as dry plates are concerned, I have given up using it altogether in favour of gelatine, and would be as loth now to return to it as a collodion worker would be to return to some of the old slow paper processes.

Amateur.

## FURTHER EXPERIMENTS WITH METHYLAL.

Through the courtesy of Mr. Warnerke I have been able to try some further experiments with the methylal developer, the details of which will, most likely, be interesting to the readers of The British Journal of Photography. We have exchanged samples of our respective products, and probably he may find time to publish his experience with my sample, as I now do with his.

I may first, perhaps, say that the Editors have scarcely apprehended the tenor of my last remarks. My complaint was not that Mr. Warnerke had failed to produce a pure material, nor that he had not made important experiments, neither did I "condemn the plates developed with the new developer because they require intensification." In the first place, I expressly stated the desirability of not using pure materials in following the published details of the experiments of others; and, secondly, while I fully acknowledge Mr. Warnerke's painstaking and his generosity in publishing his results, the ground of my complaint remains untouched, which was that, after devoting much care to experiments extending over many hours—and which, if leading to the results promised, would have been of value to photographers, but which, if unsuccessful and their results admitted, would have saved my brethren of the camera much useless labour at a busy time—all these results should have been ignored, and any benefit they might have conferred nullified, by the statement that I had obtained a diminution of one-half the usual exposure by the use of the methylal developer. I said nothing of the sort; and the only gain I admitted was one of about ten per cent. when using a rejected and worthless bath. If I showed that Mr. Warnerke's experiments were not a repetition of his first—through having been performed, as they most certainly were, under very different conditions—it was with the object of proving that his statements could not traverse the integrity of my results. The reason for any unusual asperity in the tone of my remarks will, I feel sure, be readily seen when it is remembered that that gentleman (I cannot call him my opponent, for we are working in parallel lines for a common cause) accused me in effect of not knowing the difference between intensity and rapidity—an accusation which, I need not remark,

would, if justified, render any opinions of mine utterly worthless. If the Editors are at a loss to discover why sulphuric acid should pass over from a highly-frothing mixture delivering vapour at the rate of forty or fifty pints an hour, I am afraid they would blame me for using a washing-bottle in making hydrogen gas at a temperature many degrees lower.

But the question is—"Is the methylal developer any use?" To answer it I have, with Mr. Warnerke's preparation of methylal, developed a fresh set of plates, which are now, I trust, lying at the office of this Journal, each one marked in accordance with the numbers given below; and the Editors will, with their usual courtesy, I am sure, show them to any interested visitors, and, at the same time, make whatever use of a sample of the methylal made by myself, accompanying the negatives, which they may think likely to help the progress of the inquiry.

Upon comparing the two preparations—Mr. Warnerke's and my own—I soon made the discovery that both products are of an unstable nature; for, upon the application of litmus paper, my own, which was perfectly neutral when first experimented with, has now a most decided acid action, probably through formation of formic acid, and Mr. Warnerke's a still more pronounced acidity. This circumstance alone will account for many discrepancies in working. A further examination showed Mr. Warnerke's methylal to be not perfectly miscible with water, the solution being slightly milky. This is the characteristic of the first methylal I made (see page 422), and is, I should think, owing to the presence of empyreumatic oils in the naphtha, and their having distilled over with the methylal. I may here say that, in addition to the spirits named in my first article, I purchased one sample as "purest wood naphtha," which, when mixed with water, produced a dense milky cloudiness; but without experimenting with it I rejected it at once. Probably it was caused by such an oil as might be in the methylal as above.

These facts noted, I made two developers as follows—that is, exactly to Mr. Warnerke's formula—one (A) with my own, and one (B) wi h Mr. Warnerke's, methylal:—

| | |
|---|---|
| Protosulphate of iron | 15 grains. |
| Methylal | 24 minims. |
| Water | 1 ounce. |

The iron was dissolved afresh, and not used from a strong solution I keep by me. The third developer (C) was my usual acetic iron:—

| | |
|---|---|
| Iron | 15 grains. |
| Acetic acid | ½ drachm. |
| Water | 1 ounce. |

That my experiments might be followed throughout by others, if it were wished, I ensured the condition of the bath being comparable to a certainty by making an entirely fresh one—thirty-two grains of silver to the ounce, and one minim of nitric acid 1·42.

The plates were marked with a diamond in the usual manner, exposed forty seconds each, and the developer allowed to remain on each an equal time.

Plates 15 and 16 were developed respectively with my developer and Mr. Warnerke's.

*Results.*—Both slightly fogged, but plate 16 (Mr. Warnerke's) the more so. This rendered comparison as to exposure more difficult. My verdict, however, is that the exposure on each appears identical. There was thus no difference in action between Mr. Warnerke's preparation and my own so far as obtaining rapidity went.

The remainder of the plates were developed entirely with his preparation (B) and the ordinary acetic iron (C). With regard to the mechanical action of the methylal developers I can only say that it was with great difficulty I was able to make them flow or cover at all. It required the utmost dexterity to keep the plates from streaking all over, and the image flashed out very quickly, but soon began to fog slightly, and was *very* thin when methylal was used.

Plate 17, developed with C, exposure 30 seconds.
„ 18, „ B, „ 15 „

*Results.*—Plate 18 decidedly the less done.

Plate 19, developed with C, exposure 20 seconds.
„ 20, „ B, „ 15 „

*Results.*—Plate 20 decidedly the less done. This was quite enough to satisfy me that the results I obtained with my own preparation a few weeks ago were entirely paralleled with those by the new product; yet I tried one more pair, with a changed light, thus:—

Plate 21, developed with C, exposure 30 seconds.
„ 22, „ B, „ 25 „

Still the ordinary iron and acetic acid (C) was unmistakably the better exposed; the sitter moved during the exposure, but still a correct opinion could be formed. It may be noted that in all, except plates 21 and 22, the same sitter, in the same position and with the same accessories, was taken so as to enable the most accurate decision to be arrived at. The last two plates named would have also followed suit, but a sitter interrupted the work, and so he was experimented upon with a plate then ready. As I stated at the outset, the negatives are to be seen at the office of THE BRITISH JOURNAL OF PHOTOGRAPHY, 2, York-street, Covent-garden; they speak more forcibly than pages of letterpress.

As I write, an explanation occurs to me that would account for all discrepancies. May not the collodion used in other experiments have been one adapted for emulsion work—an intense one, and such as, used in conjunction with an intensity-producing bath, would have caused too much density in the negative if the developer were permitted to act the usual time? The results would then be that, to avoid excess of density, the acetic iron developer would be washed off before its action was complete, but the methylal, through producing such initially weak negatives, would have time allowed it to develope to its utmost extent, and so, under the above conditions of bath and collodion, would apparently work more quickly and give sufficient intensity. It is not by any means to be assumed that because a developer gives weak negatives it is therefore to be concondemned; my experiments bear only upon comparative rapidity, *and not on the question whether a good negative can be produced with methylal.* G. WATMOUGH WEBSTER, F.C.S.

## THE LEEDS EXHIBITION.

THE exhibition now open at Leeds is devoted to "exhibits in mechanics and art," with a sparse intermixture of science, and along with the refinements of life "on show" the photograph is invariably to be found as the embodiment of an idea or the representative shadow of it.

Passing through this fine old and thriving town I naturally gravitated in the direction where the *quasi* art of photography would with unerring pencil depict—perhaps too truthfully—the view of men and things around.

Before reaching the exhibition building, but near to it, Mr. Wormald's large views of the Yorkshire abbeys seem to dwarf all the small knick-knacks offered for sale in the shop window in which they are placed, or maintain a sort of rivalry (in point of size only) with the placards that announce the enterprise of the Exhibition Committee round the corner.

The name of Mr. Wormald has long been associated with very large photographs, and a glance at *Byland Abbey* (two views of it) satisfied me that something more than mere good manipulation was requisite for works like those before me. The views are selected with much artistic appreciation. Lest Mr. Wormald may shake hands with himself in a too friendly spirit it is as well to remind him that the view of *The Nave of Kirkstall Abbey* would have been improved in an artistic sense had his point of station been brought more closely to one side, as the vanishing lines on both sides of the picture have the duplicate appearance always damaging to a work of art.

Mr. Ramsden (whose name is familiar to the readers of this Journal from the Woodbury print in our last year's ALMANAC) exhibits in his own window a very large view of the interior of the exhibition, which I take to be an autotype enlargement. The size is that known as "kit-cat," and is a very good sample of such work; but the subject is one which, from choice, would hardly induce an artist to select it as anything possessing imposing or inherent grandeur.

A saunter round Leeds makes it evident that art is nurtured in many forms; for several galleries, with their oil and water-colour paintings, their bronzes, and ceramic wares, have an air of prosperity mixed up with the objects of art offered for sale.

Judging from the number of fine-art establishments in the town that appear to have been set up or settled down—whichever is best to express it—the refined portion of man's understanding is here catered for, as well as those substantialities of life that are always first on the great bill of fare which sets forth our likes and preferences.

From an inquiring look (I am afraid it is but a look) that I carry with me into picture galleries I am constantly viewed as a probable purchaser, and become the recipient of much voluntary information upon the merits of pictures generally, very much of which small talk upon these matters will bear translating into the photographic art, and be more fruitful of permanent good to the photographer than a basketful of chemical formulæ, or the exclusive right of working on a negative in a manner foreign to art.

Artists have had a glorious time of it during the past dozen years, and I am told by one (who spoke like a prophet) that Messrs. Agnew and Co. were the backbone of its support, owing to their respectable notion as to keeping up high prices. When they collapse we shall all be

*non est.* Believing that I was treading on the threshold of art I did not quite understand whether it was a hint for photographers to get out of the art line or a warning not to lower the price of photographs; but, evidently, lowering prices has a direct influence upon some of us, resulting in our fading into nothingness. However, my peregrinations must lead me to the exhibition proper, at the entrance of which I pay my shilling admittance.

The first impression received is that order and method have not reigned supreme in the arrangements, or in carrying into effect the desired intention of the exhibitors, for the amateur hand is visible wherever classification is attempted. Oil colours, water colours, marble mantelpieces, photographs, and the thousand-and-one objects of *vertu* to be seen when sought for, look as though they were under the charge of the "hall-porter" prior to their being arranged and classified, and the only consolation for the mortification photographers are likely to feel is that they suffer in good company.

I fully expected that photography would be well represented; but as far as quantity is concerned the display is poor, although this shortcoming on the part of Yorkshire artists is in some measure atoned for by the quality of the work exhibited. Mr. Hedges, of Lytham, who has sent a case of photographs, would, I am inclined to think, maintain his repectable position even in a more hand-to-hand photographic fight. The horses and dogs by this artist have a natural pose, showing an absence of that restraint with which even a horse or dog may be invested on the occasion of having its likeness taken. The pictures are about whole-plate size—vigorous, yet soft. This last great quality in photography is often the consequence of working the lens with almost open aperture, and is, moreover, frequently the little *something* that we are short of in making us successful rivals of neighbouring artists. Mr. Wormald's large pictures are hung close to these, and from the solidity of the view and the roundness of the objects in the foregrounds the question often put respecting the different qualities of enlarged pictures from small negatives or those taken direct can in some measure be answered. It would, indeed, be an advance in education for many of us to obtain a good direct picture of any subject, using this as a standard to judge of our enlargements. Although they may differ, and be equal in many respects, few, I believe, will be able to obtain that range of tints by any enlarged process which can be secured by direct pictures and skilful manipulation.

Mr. Hanson has three or four pictures by what he calls "cretacious" photography. It is, I am led to believe, an outgrowth of some lithographic process; but the pictures look well, and that is the least that can be said about them at present, seeing that the mention of the merits or demerits of secret processes produces a sort of acute photographic inflammation, incurable by the agency of any prescription that can be offered through the medium of this Journal. Mr. Hanson's process is equally suited to carbon pictures, judging from the specimens he exhibits.

The art-rooms are closed at dusk, and my good intention was prematurely cut short, or I might, by paying no attention to the catalogue and by a little quizzing behind marble mantelpieces, probably have discovered some photographer's neglected show-case, or, at least, some artistic bit that had sought refuge in this asylum. My curiosity revealed to me, at the back of some portion of a mantelpiece, a water-colour drawing of a remarkable church at Great Yarmouth, its great distinguishing features being three large gables of equal proportions, something after the fashion of a London market. Another little narrow recess, with just sufficient room to pass between two marble mantelpieces, discloses a neglected water-colour drawing of Halifax Infirmary, immured in darkness. So if any photographer has had his repose of mind disturbed, owing to a refusal to receive his pictures, it will be balm to his afflicted feelings that the slight was less mortifying than success in his efforts probably might proved to have been.

In taking a turn amongst the looms and machinery, which have been the instruments to which Yorkshiremen owe their accumulation of the vast fortunes being daily made in this rich county, it was just possible I might have seen "something to my advantage;" but I was again attracted by the large photographic views of the various machines at work, showing the very extended use now made of our art, and, at the same time, making manifest that Mr. Wormald has got possession of the field in this line of business.

Amongst the looms and rattle of machinery, but at the end of the room, is a case of carbon portraits by Mr. Greaves, of Halifax. Some of these were very large. One picture of two children taken almost life-size shows clearly what an imposing and apparently truthful picture can be made by photography. The pose is artistic and graceful, and the manipulation faultless. Another picture—a portrait of a gentleman, with head almost life-size—is equal in every respect to the large photographs which competed for the Crawshay prize. The other portraits are very good specimens of photography; they would grace the walls of any exhibition, and deserve to be placed in the very first rank, instead of the makeshift position they are compelled to occupy.

PORTE CRAYON.

## FOREIGN NOTES AND NEWS.

DR. SCHNAUSS'S PHOTOGRAPHS OF ELECTRIC SPARKS.—THE *MITTHEILUNGEN* ON THE "PROMENADE" PICTURES.—LIGHT AS A MOTIVE POWER.—AUBELDRUCK AGAIN.—M. BOIVIN'S METHODS OF PHOTO-ELECTRIC ENGRAVING.

LAST winter Dr. Schnauss occupied his evenings with a series of experiments relating to the photographic action of electric currents and sparks, of which he gives an account in the *Archiv.* In the course of these experiments he became convinced that forms like those known as "Lichtenberg's electric figures" can only originate when the electric spark comes into immediate contact with the sensitised film; at least, he has not succeeded in obtaining them as Professor Rood, of Troy, New York State, thinks can be done when the photographic film is only exposed to the electric sparks protected by a thin sheet of glass or mica. He used small glass plates, held in front of the point of the conductor by a damp hand. In his first experiment he allowed the sparks from a positive conductor to fall upon an unwashed collodionised plate taken from the silver bath, the metallic point from which the current emanated being placed vertically over the plate at a short distance from it. Round the place subjected to the shock a number of imperfect, reddish-yellow sparks flew; these produced sharp, many-rayed, starry marks, which were much more distinct when the plate was developed than those produced by the central current.

The forms of the sparks obtained by the negative currents were very different from those obtained by the positive. The latter resembled in form a star-fish, and were of almost equal depth. The former were much rounder and had a dark spot in the centre. At first the negative current seemed to act more strongly than the positive, but on development it was evident that it was the weaker of the two. If the plate, after being charged and before development, be held in front of an orange-yellow glass, and examined through a magnifying-glass by the light of a candle placed behind the yellow glass, a number of microscopically-small black points will be visible; these are apparently the points of contact, and the centres of the stars brought out by the subsequent development. The image is beautiful on ferrotype plates.

A stronger image was obtained with iodised collodion than with uniodised. Dry plates prepared with morphia, bromine, and albumen were not acted upon by small sparks; only strong shocks from Leyden jars caused a slight browning at the point of contact. It was the same in the case of wet plates coated with iodised silver collodion. A number of other chemicals were introduced into the collodion with various results; of these, plates prepared with sulphate of lead were fixable in the usual way with hyposulphite of soda.

In pursuance of the idea that there may be some connection between the mechanical action of electricity and what has been called the effects of latent light Dr. Schnauss wishes some one would carry out a further series of experiments. He himself sensitised a sheet of paper with iodide of silver in the calotype manner, laid it upon a metal plate, and allowed a number of strong sparks from Leyden jars to fall upon it. The paper was pierced with small holes in various places, but when placed in a bath of gallic acid it showed visible signs of action upon the salt—indeed, unmistakable signs of the action of light.

The *Mittheilungen* contains a leader upon the newly-introduced "promenade" pictures. The writer argues that though the cabinet size of picture is admirably suited for spread-out toilets, half-lengths, and busts, yet for whole-lengths of tall, slender persons the spaces on either side of the figure require too much filling up, thus making out a case for reducing the width of the cabinet in the portraits of slender persons; but he would prefer narrowing the width and retaining the height of the cabinet to adopting the "promenade" form, the proportions of which—the height twice the breadth—seem to him inelegant. He also justly remarks that the greater space overhead is more difficult to fill in than the extra width of the cabinet, and if left empty is apt to become monotonous. If, however, the extra space were added to the foreground, and the head of the figure placed about the same distance from the upper edge of the picture as in the ordinary cabinet, then he thinks the "promenade" picture would be "the thing" for short and slender persons, as it would

give them an appearance of height. The question is—Will short and slender persons allow themselves to be taken on a special size of plate, or will they not follow the fashion like their neighbours?

In a leader which *Stummers' Ingenieur* devotes to Mr. Crookes's discovery of certain remarkable phenomena of attraction and repulsion under the influence of radiation a hope is expressed that, at least, one of the many interesting experiments he exhibited at recent meetings of the Royal Society (London) will be turned to practical account. If the vista of possiblities opened out by Mr. Crookes's discovery be realised, the time may come when sunlight will enter the lists with water, wind, and steam as a motive power, and to "weigh a sunbeam" will be no mere figure of speech.

At present, however, we will indulge in none of these dreams, but content ourselves with hoping with the *Ingenieur* that the "radiometer" will be elaborated into a serviceable actinometer. The radiometer is a miniature windmill which, when enclosed in a vacuum, begins to revolve as soon as a lighted candle is brought near the glass receiver, and the number of revolutions per minute increases in proportion to the nearness of the candle and the intensity of the light. The sensitiveness of this apparatus to light and heat is so great that Mr. Crookes had to contend with great difficulties in showing it in motion at a meeting of the Royal Society, as the radiation from the sunlight in the roof of the hall affected it materially.

Speculation is still rife in German photographic circles as to the secret of Herr Aubel's process. A writer in the *Photographische Correspondenz* tried to test Herr Leipold's guess that it is a combination of hyalography and photography, but obtained no result. He thinks, however, that he may be more successful with Sim's glass engraving process, which has been revived lately. Another suggestion is made in the *Mittheilungen*, to the effect that Herr Aubel obtains by heliography an impression in fatty inks, which is transferred to stone and converted into a printing-plate by the action of acid.

Trade marks not registered in Germany according to the new German law before the 30th inst. will lose all right to legal protection. Anyone wishing to use them will be at liberty to do so.

In the *Bulletin Belge* M. E. Boivin gives an account of his method of photo-electric engraving, which consists in coating a sheet of albumenised or gelatinised paper with a layer of gum arabic. When dry it receives a second coating of bitumen dissolved in benzine to which a little ether is added. The exposure is made in the ordinary way and requires from fifteen minutes to an hour according to the light. The exposed bitumen is then transferred, by pressure, to a polished and grained plate of metal, which is first wetted with turpentine. The paper is removed by means of warm water, and the development effected with turpentine containing a little benzine. The image is then washed gently with a solution of cyanide of potassium and afterwards with water, and is then dried and exposed to light for the purpose of hardening the bitumen forming the image. It is then engraved either by means of acid direct or, preferably, by the battery. By printing from a negative a typographic plate is produced, while for proofs in the style of copperplate it is necessary to use a positive. This order of results may be reversed by subjecting the developed plate to the action of an electrotyping battery, so as to form a deposit of copper upon the bare metal. The bitumen is then removed and the plate submitted to the action of very weak nitric acid, the copper film protecting those portions of the surface upon which it rests. Another process is to cover a finely-polished zinc plate with a thin film of silver by the aid of the battery; this is then treated in the dark with an alcoholic solution of iodine, washed, and passed through a solution of tannin or pyrogallic acid, and dried. The plate, after exposure, is attached to the negative pole of the battery and plunged into a solution of gold, when it is found that those portions of the iodide which have been acted upon by light have become conductive and receive a deposit of gold, the other portions remaining neutral. The iodide of silver is then removed by means of cyanide of potassium, and the plate submitted to the action of weak acid in the usual manner.

## Contemporary Press.

### RELATION OF THE SILVERING TO THE TONING BATH.

[Philadelphia Photographer.]

There are a great many photographic printers and toners daily in the habit of silvering and toning photographic paper, both plain and albumen, who do not, nor never have, paid the least particle of attention to several matters, viz.:—1. The relation of the silver to that of the toning bath. 2. The relation of the silvered paper to the toning bath. 3. The different effects caused by the preparation of the toning bath.

Taking up these three topics in their order I will endeavour to show, in the first place, why these two baths ought to be worked in harmony, and also what disastrous results follow their discordance.

To a careful observer of the results of a peculiarly-made nitrate of silver printing bath there is always much valuable information afforded, which from inference has often led the party to adopt or discard some particular chemical, as the case may be, and, when wisely done, is very instructive, besides being strongly indicative of a sound judgment. This is especially the case when experimenting with differently-compounded negative collodions.

Now, seemingly the fact whether our silver printing bath is alkaline in a greater or less degree does not seem worthy of contemplation *as long as it is alkaline;* for as long as it is so it will be "all right," by which is meant that the paper will not print "red and flat," but, as is often said, of a "rich colour" when it is of a decidedly "dingy blue." To suit another class of printers I will soften the above-expressed opinion, and say "the paper bath is 'all right' as long as it prints neither 'red or flat,' nor 'blue or dingy.'"

Now, without regard at present as to how the paper prints, let us notice the action of a properly-made toning bath upon the silvered paper. We will suppose the print placed in the toning bath has a rich red colour. You watch the action of the gold bath upon it, and admire its beauty as this colour commences to disappear and assume a richness and delicacy of tone that will cause a thrill of pleasure to run through your entire being.

If your nature be sensitive to the admiration of the beautiful bordering on the delicate you will at this time behold new beauties in the art that will stimulate you to greater and loftier attainments in your calling, and for the time being you will be utterly oblivious to aught else but the work upon which you are engaged. (Alas! that such concentration of the mind cannot at all times be commanded is a fact for us all to deplore.) Visions of the future, all of which will flatter your vanity immensely, will continually be passing through your mind as you contemplate the beautiful appearance of the print in the bath. Why will not such thoughts come to our assistance when the body is more or less prostrated, and the brain gives indications of approaching exhaustion through ceaseless toil, and seemingly with so little accomplished that we are "far below par" in our own, and long ago in others', opinion? If like thoughts were to come to our aid at such times with what greater rapidity would we get all things righted again, and everything would then run as smoothly as "oil upon the troubled waters!"

Now the time has come when the print, placed in the gold bath, is ready to be removed to a tank of running water until ready for the soda bath. In the meantime you proceed to tone the rest with a hopeful heart, congratulating yourself the while that your prints on the following morning will be "splendid."

They are toned; they are fixed. You are disgusted; you are mad; and what for? Simply because your prints are "over-toned." And why do you blame "the boy," who probably had not taken interest enough to have anything to do with them (strange to relate)? Is it not rather a surprising fact to note what credence is always given to the blame attached to "the boy," if anything happen to go wrong with any of the "skilled workmen?" So do not blame that much-to-be-pitied assistant, but attach the blame to yourself. "Well," you may ask, "how can that be? for I toned them just exactly as red as I did last night, and here they are as blue as an indigo bag. No; the fault is not with me, for the reason I have just stated, but with the chemicals, and most probably with that toning bath."

Poor soul! you do not think that the trouble is not with your toning bath, and were in great trouble until time changed it for the better, and ever afterwards it remained a fact that this was only one illustration of the much-quoted remark about the "fickleness of chemicals."

Now, why did you over-tone? Was it because you were mistaken about letting the prints remain in as long and until they reached the same tone as they did in the preceding evening or not? No, you did right there; the trouble was nothing else than that the silver bath was more alkaline than it was the preceding day.

Probably you had either thought that the bath for sensitising was not alkaline enough, and had placed some more in, or had made up a new one, which was, when ready for working, more alkaline than the one used on the day previous, and was either the result of ignorance or intention; if the latter was the case, then ignorance was displayed at the toning bath by the party operating upon it.

There is another way in which the desired alkalinity of the silver bath may be changed, and coming, as it does, from an unsuspected source has often made the solution, sometimes rapidly but more generally gradually, alkaline, and the bewildered toner finds he is continually over-toning, and that he is at times very uncertain about the result of his labours. This trouble arises from the stock solution, or, as it is sometimes called, "adding solution," which is nothing else than a fresh bath of nitrate of silver and water of a greater strength than the one in use. If care be not exercised in the preparation of this solution

it is very likely to be made right alkaline, and being a new and pure bath also it will gradually change the regular solution to a state that will very often mislead the party or parties working with it. For this reason and others too numerous to mention here it is always advisable to test the bath every morning before use to see how the strength is as well as the alkalinity of it.

"Why does the alkalinity of the silver bath affect the tone of the prints?" you may ask. It is a well-known fact that, with many of the solutions used in photography, the nearer the baths approach to alkalinity the quicker will be the action of light, &c., upon them. This is seen in the case of the negative bath. The nearer this bath approaches to an alkaline state the quicker it will work as regards exposure, and the more acid it is the slower. When we desire to keep our stock gold solution from "throwing down" we do not make it alkaline, but acid, because in the latter state the acid holds it in suspension. When we desire to sun our bath, whether negative or positive, we first make it alkaline, so that the organic matter will be precipitated. When we boil our bath we also make it alkaline. When we tone prints we make our gold solution alkaline, so that it will tone both with rapidity and ease, and be also economical and delicate. Thus it is readily seen that alkalinity hastens operations, and hence the conclusion that the more alkaline the solution may be the quicker the deposit.

Now this is evident in the case of the silver bath. When it is only slightly alkaline, and the toning bath is likewise, then the harmony between the two will result in excellent work. When the silver bath is *quite* alkaline and the toning bath is *slightly* so there is then no perfect harmony between the two. The action of the toning bath on prints printed upon paper floated on a *very* alkaline silver bath is a follows, viz.:—The gold in the toning bath commences, of course, to precipitate on the print, and, if the bath be not too strong, it is done in a gentle and delicate way to all perceptible appearances, and at this state of affairs it is always done in a way that will very frequently call forth admiration from the workman.

The way the print was prepared previous to its entering the toning bath has rendered it so that it is in a state to take up the gold much more rapidly than is perceived by the eye or supposed by the judgment, owing to our knowledge of the strength and alkalinity of the toning bath, and the result is simply an over-toned print.

But space will not permit me to write further this time. Next month I will conclude. C. W. Hearn.

# Correspondence.

Close of the Geographical Society's Exhibition.—On Dry Plates.—Fatty Ink Proofs from Carlos Relvas.—The Exhibition of L'Association Belge de Photographie.—Filtration of Albumen, &c.—A Suggestion by Dr. Fleitmann.

The very interesting exhibition of the Geographical Society has now been brought to an end, and I think it is right to acknowledge that photographic art contributed in a great measure to its success. The remarkable proofs of the transit of Venus taken by MM. Andra and Angot, as well as landscapes of the Isle of St. Paul, taken by the latter gentleman (on dry plates prepared at Paris), attracted attention. The photomicrographical proofs of the micrographical study of the soil of Vesuvius, Etna, and other volcanoes, prepared by M. Fouquet, of the College de France, and enlarged 800 diameters in the photomicrographical laboratory of that institution, took a prominent part, and arrested the attention of *savants*. M. Fouget left Paris last week for Santorin (Grecian Archipelago), where he has been sent by the French government on a scientific mission to study the nature of the volcanic soil. In accomplishing this he will call in the aid of photography to assist him in his investigations. For this purpose he has taken with him a great number of dry plates, which he intends to develope when he returns to Paris three months hence.

Great discussion and agitation has prevailed in France for the last few weeks as to the respective merits of dry plates prepared with the collodio-bromide emulsions and those sensitised in a bath. Many gentlemen—amateurs and others—have taken in hand to experiment on emulsions, among whom I may mention MM. Chardon and Andra. These gentlemen have not yet succeeded in working with such confidence or in obtaining a series of results as good as with bath plates. Whenever I have supplied collodio-bromide plates to my *clientèle*, agreeably with their express instructions, I have always been told that they were not as good as bath plates; notwithstanding that every possible care was taken in their manipulation. At first I could not account for this; but happily my mind was set at rest by a gentleman whom I believe to be one of the most competent in emulsion work—I allude to Mr. W. J. Stillman. That gentleman honoured me with a visit when passing through Paris, and on my informing him of my seeming non-success with emulsions he told me that he had always given it as his opinion, in the photographic journals, that a good bath plate was superior to one prepared with an emulsion. For the last few years I have been able to overcome the difficulty, and can now obtain a very dense film with a bath. In order to do so I take a quantity of collodion which I suppose to be sufficient to cover the number of plates I have to coat, and for every fifty ounces of the same I add fifty grains of nitrate of silver, this being sufficient to give it a creamy appearance. The plates are then plunged into the silver bath, and, after having been washed, an alcoholic solution is poured over them containing the organifier. They are then allowed to dry, which they do more quickly and better than when an aqueous preservative is employed. In general, amateurs here have a repugnance to employ emulsions, and prefer to purchase plates ready for use. They tell me that one of the greatest difficulties they have to contend with is to clean and coat the plate in an even manner, not to speak of the dust to be encountered in drying and the fatigue of working in a strange hotel in the evening after having been sight-seeing the whole of the day. These manipulations, they say, are enough to act like cold water upon the courage of any amateur, be he ever so energetic.

I received a very friendly letter and several remarkable proofs in fatty ink from the celebrated amateur, M. Carlos Relvas, of Portugal. It is, indeed, a very pleasing duty for the correspondent of a scientific journal like The British Journal of Photography to give honour where honour is due, and to bring to the notice of the photographic profession those men who devote their time, energy, and often their fortunes, to the advancement of science. The specimens I received from that gentleman are very beautiful. The portrait of an Alpine peasant girl surrounded by her native mountain scenery is, indeed, a *chef d'œuvre*, not only from an artistic point of view as a picture, but of the calotype process. The view of his magnificent studio, surrounded as it is with beautiful plants, trees, and shrubs, looks so charming that one could wish to have wings to fly away to a country possessing such delightful verdure and such splendid prospects. Happy, indeed, is the country possessing such amateurs, and architects capable of carrying out their plans! No expense has been spared. A sum of £7,000 sterling has already been employed to build a studio in connection with the art he loves so well. M. Carlos Relvas has the intention of sending to England for the inspection of the English public some proofs executed in his new studio. For this reason he begs the Editors of The British Journal of Photography to inform him when the next exhibition of photography will take place in that country.*

Speaking of exhibitions, that of L'Association Belge, held in the Salle Vaux Hall of Brussels, has been very successful. It is very pleasing to be able to bear witness to the success of such an enterprise, for we know how difficult it is to organise an exhibition. In the present instance it can be seen that it has succeeded only by the energetic will of a society yet in its infancy, and by the undaunted perseverance of a few of its adherents. The photographic world was at first astonished by the appeal made to it by a society which had hardly been formed; but, when it was discovered how disinterested and honourable the members were, confidence soon took the place of doubt, and their appeal was responded to heartily. The photographic journals took it up, among which this Journal was not backward. I am happy to see that some of our countrymen have borne off honours, among whom Messrs. Spencer, Sawyer, Bird, and Co. may be mentioned; the marvellous proofs exhibited by them secured legitimate success. It is to be hoped that the perseverance of what may be called an "infant" society may set an example which will be followed up by other societies in every country; thus, not only will science be advanced, but a spirit of friendship and a love of peace will pervade the world.

Much has been said and written about the filtration of albumen, and if I dare to propose another mode to the readers of The British Journal of Photography it is because I find many advantages in the system I employ in my laboratory, which manner of filtration not only permits me to filter albumen without trouble or waste of time, but also

* We may here state that the next photographic exhibition in this country will be opened at the Institute of the Society of Painters in Water Colours, 5, Pall Mall East, London, on Tuesday next, the 28th inst., with a *conversazione*. The last day for receiving works was yesterday (Thursday), the 23rd inst. As the Exhibition will remain open for two months, we have no doubt the Council of the London Photographic Society would gladly receive and display the art-contributions of so distinguished an amateur as M. Carlos Relvas, should he even now forward examples of his work for that purpose.—Eds.

collodion, as well as syrupy liquids. I take a bottle, which is well known in France, and I believe is becoming so in England, namely, a syphon soda-water bottle. I unscrew the metal apparatus from the top and cut the bottom out. It is then turned bottom upwards, and a piece of cotton is put into the neck and the bottle-funnel filled up with the liquid to be cleansed. If not sufficiently clear another funnel of the same form can be placed under the first. Sometimes I have as many as four or five of such filters in action at the same time. To do this I take a strong, wide band of leather or india-rubber about ten inches in length, and I nail the two ends to the wall in such a manner that the bottle-funnel is held upright; a little lower down I nail another band for another bottle, and so on till I come close to the floor. I have only to put my funnels in their respective places, fill up the top one with the solution to be filtered, and set an ordinary bottle with a funnel in its neck to receive the clear liquid. I can then go about my other business, being sure, sooner or later, to find the well-filtered liquid in the lowest bottle. There is a precaution to be taken if the liquid to be filtered be collodion or any other solution liable to loss by evaporation, viz., let the neck of each bottle-funnel enter as far as possible into the top of the lower one; this will prevent too great a surface being exposed to the air, and consequently evaporation will be diminished.

It is by the study and work of many that we enlarge our stock of photographic knowledge, and a man only does his duty when he seeks to know the "reason why" of everything that occurs in his photographic manipulations. Alas! I must plead guilty to neglect, for I have very often used two filters, one above the other, in a single funnel, in order to clarify a solution of nitrate of silver when the latter has presented a heavy deposit of insoluble bromide of silver and organic matter. This I did with the intention of sparing myself the trouble of filtering so large a quantity as eight quarts a second time; but I must confess that I did not remark that in so doing the liquid ran through much more rapidly than with a single filter. Such, it appears, is the case; at least, so says a German Doctor, Herr Fleitmann, who has lately published some very curious and interesting observations on that subject. "If," says he, "two filters instead of one be placed in a funnel the liquid runs through in half the time; if three be used it makes its way much more rapidly." According to other experiments made by the learned Doctor it is preferable to employ thick paper for making filters than thin, because the liquid runs through much more rapidly. This is very easy of belief, because, the folds of the paper being very thick, the weight of the liquid cannot force the paper against the sides of the funnel, and so neutralise in a great measure its action. It will be very easy for any photographer to try the experiment and judge for himself of the value of these observations. The photographic community will be thankful to Herr Fleitmann for his valuable suggestion, for it will spare time, and "time is money."

3, *Place Bréda, Paris, September* 20, 1875. E. Stebbing, *Prof.*

## METHYLAL.

*To the* Editors.

Gentlemen,—In the last week's issue of your valuable Journal Mr. G. Watmough Webster expressed himself dissatisfied with my mode of preparing methylal. Leaving aside all the personal matter, which can be of no interest to the readers of The British Journal of Photography—especially as it has been already satisfactorily disposed of by the private interchange of courteous letters—I will only make a few remarks respecting the divergences between Mr. Webster's experiments and mine.

The wood naphtha, as described by myself, was of a slightly golden tint. This, as I have since ascertained, is the usual aspect of the rectified wood naphtha. Mine was supplied by Mr. David Smith Kidd, Commercial-street, Shoreditch—one of the largest distillers in London. The colourless product is known in the trade as "pyroxylic spirit."

The water bath I used in my second experiment for distillation is a very appropriate mode of applying heat when a low and definite temperature is required. I adopted it in order to obviate the local inequality of temperature of the lower portions, far above that of the supernatant liquid, caused by the action of the naked flame upon the badly-conducting mass of manganese salt and broken glass—an agglomerate so firm that in my first experiments the retort was broken by the attempt to remove it.

Respecting my test for the absence of methylic ether verifying Mr. Webster's statement, I found some divergence of opinion. My statement on the luminosity of the flame of the methylic ether was based on the opinion expressed in *Traite de Chemie, &c.*, par T. Pelouze et E. Fremy, vol. v., p. 480, where, in the description of the properties of the methylic ether, its flame is called "luminous." But when I looked for a verification of that in Gmelin's *Chemistry* I found a statement conformable with Mr. Webster's views. Having neither time nor opportunity to verify the former, I am rather inclined to adopt the latter, opinion.

On the question of smell I distinctly disagree with Mr. Webster, and still compare it to ether, but certainly not to acetic acid. Gmelin compares it to acetic ether.

Through the courtesy of Mr. Webster I have had some of his methylal for the purposes of experiment, and which I have tried accordingly. On comparing the results on the portions of negative developed with mine and Mr. Webster's methylal developer, I found that with the same exposure the amount of detail was nearly equal, while my own methylal gave a much denser image and of different colour, which distinctly shows the difference in the product.

I do not wonder at similar experiments in the hands of two persons producing considerably different results—so many varying elements, in the shape of collodion, silver bath, and developer being introduced. But I cannot doubt that my conclusion is based on the unmistakable evidence visibly preserved in the negatives I forward with this communication to the office of your Journal.—I am, yours, &c.,

10, *Linden Grove, September* 21, 1875. L. Warnerke.

[The negatives alluded to by Mr. Warnerke are in our possession, and may be seen on application at our office. In one negative—one half of which is developed by the "methylal developer," the other being by plain iron with acetic acid—the difference is greatly marked, and in favour of the methylal, one being indeed much over-exposed in comparison with the other. In the other negative, also divided—its halves being mounted side by side—one half has been developed by Mr. Webster's, the other by Mr. Warnerke's, methylal. The latter is the better negative.—Eds.]

## MR. VANDER WEYDE *VERSUS* "FREE LANCE."

*To the* Editors.

Gentlemen,—Whether it is good taste in "Free Lance" to revive a transaction belonging to the past, for the purpose of sneering at the "craft and diplomacy" as it appears in your advertising pages, I leave your readers to determine. I have no intention of entering into a detailed answer to an anonymous correspondent, who, by false assumptions, would sneer away the good name of men doubtless as good as himself, and who, in all their transactions are not afraid to appear before the public at all times under their own names.

I was much less experienced when I first came before the photographic public than I am now, and possibly was easily led into some errors through my inexperience; but, in making some variation in the price charged for my system of finishing pictures, I did nothing more than propriety and fairness demanded. An exclusive right for an important district is surely worth more than a non-exclusive right for a small district. In any case the price charged does not affect "Free Lance," as he well knows; and in all cases a fair bargain was made and adhered to.

The misrepresentations of "Free Lance" and misunderstanding of the principle of my studio window I shall not attempt to discuss. I believe I have something to sell which will be valuable to photographers. If "Free Lance" do not want it, and imagines his "own little box among the tiles" is incapable of being improved upon, let him rest content.

I feel quite at home when grasping my sword in a good cause or "slinging paint" as a profession, and occasionally introduce my inventions when I consider them a boon to the profession; but I cannot condescend to enter into a wordy war with people who throw their missiles from behind a hedge.—I am, yours, &c.,

36, *St. James's-place, St. James's-street, London, W., Sept.* 20, 1875. Henry Vander Weyde.

## CEMENTING LENSES.—INDIA-RUBBER SUBSTRATUM.—PHOTOGRAPHS BY MOONLIGHT.

*To the* Editors.

Gentlemen,—Some few weeks ago I bought a pair of stereoscopic lenses. On examination I found that the Canada balsam in one of the cemented lenses had given way, forming a kind of cockle-shell mark about a quarter of an inch long. There are also a number of what seem to be damp spots on the glass. Could you tell me how to separate the component lenses of the cemented lens without danger of breaking or smashing the glass? and, also, how to remove the damp spots? I tried to melt the Canada balsam by putting the lens into a hot oven, but it did not answer, and I was afraid to allow it to remain in too long for fear of smashing. I also tried to clean off the damp spots with strong muriatic acid, but failed.

Latterly there has been some talk of the liability of dry films prepared with a substratum of albumen containing ammonia to blister. Will you allow me to recommend a substratum that I have been using

for the last nine months both for wet and dry plates, and during the whole time I have not had a single picture damaged or spoiled by blisters? It is quite as cheap as albumen, and, what is of greater consequence, not so "messy." I take a piece of pure rubber and cut off a slice about the size and thickness of a penny. This is chopped up fine and dissolved in four ounces of *common benzoline*, such as is used for burning in the ordinary benzoline lamp. The rubber dissolves readily and forms a clear, bright solution. There is no need of filtration. The glass is slightly rubbed over with a cloth, dusted with a camel's-hair brush, and the rubber solution flowed on in a similar manner to collodion. The drying is almost instantaneous. The plates coated with this substratum may be washed under a heavy flow of water without any fear of the film giving way or blistering. I have washed mine under a half-inch tap, allowing the water to fall a distance of seven or eight inches, without the film being in the least damaged, whilst plates prepared with an alkaline albumen substratum have blistered and split in all directions.

I prefer benzoline to either bisulphide of carbon or chloroform. The latter is too expensive (apart from its being anæsthetic), and the former is objectionable on account of its very disagreeable odour. The benzoline I use I procure from the drysalters' at eightpence a quart, and I find it answer quite as well as the purer kind.

A few days ago a friend of mine and myself were speaking of Mr. Breese's moonlight photographs. A gentleman (an intimate friend of Mr. Breese's) possesses about a dozen pictures of moonlight scenes which were presented to him by Mr. Breese; he showed them to my friend, solemnly affirmed that they were taken by moonlight, and said that Mr. Breese had offered to show him how to take them. He also mentioned the fact that Mr. Breese had demonstrated to Lord Lennox his method of producing them. I, on my part, refused to believe that they were taken by moonlight at all. I am quite aware that it is possible to photograph the moon; but I have wholly failed in getting a photograph by moonlight, and I have tried some of the most sensitive plates in the attempt. I should be glad to know what you can say on the subject.—I am, yours, &c., EDGAR E. WIGGLESWORTH.

*Greenfield House, Farnworth, near Bolton,*
*September 17, 1875.*

[In order to repair defective cementation in a lens have it, first of all, removed from its setting, and then place it in a vessel of lukewarm water. As soon as the lens has become warm, add hotter water, and after the lens has thus acquired a higher temperature remove it and press firmly the edge or margin of the convex lens, which, owing to the balsam having now become soft, will easily slide from off the flint lens. The old balsam must now be entirely cleaned off by means of turpentine, benzole, ether, or old collodion; and, after wiping the surfaces with a wash leather, a single drop of new balsam is placed in the centre of the concave lens and the other lens pressed down upon it. The drop extends until the superfluous balsam oozes out at the edges. Heat is now applied, and when the balsam has become hard at the edges the lens is cleaned with benzole and replaced in its cell.—With respect to the so-called "moonlight" photographs by the late Mr. Breese, they were taken by ordinary daylight. It is absolutely impossible to take such pictures by moonlight.—EDS.]

## EXCHANGE COLUMN.



## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

G. WATMOUGH WEBSTER.—We have received, just as we are preparing for press, the negatives referred to by Mr. Webster in his communication in another page.

INQUIRER.—The third lens in your list is the most rapid in action, but the sixth will prove to be the most useful; hence we advise you to decide the purchase in its favour.

C. B. D.—An alkaline infusion of malt has been suggested and even used as a preservative; but we understand that the negatives resulting from its employment were unsatisfactory. Use the malt wort without any ammonia, and you will succeed much better.

AJAX.—We have looked through the last two volumes and cannot find any such formula as that to which you allude. If you refer to the column of "Answers to Correspondents" in our last week's issue you will find that publication can scarcely have been made.

W. (St. Boswell's).—We have of late had a similar experience. Up to the present time we are unable to suggest the best remedy. As we shall be making further trials of the plates before our next publication it is possible we may discover the means of rectifying the fault. If so, we shall indicate the remedy next week.

ONE IN TROUBLE.—We arrive at the conclusion that you must have been using iodide of potassium by mistake instead of bromide. There is no other way by which we can account for your singular experience. Send us a small crystal of the salt, and we shall then know of what it consists.

AMATEUR.—You act wisely in having the ridge two feet out of the centre; but instead of having the wall six feet high at the side it ought to be eight or nine inches higher. We advise you to adopt the proportions named, viz., 32 × 16 feet. If your light is unobstructed you will have an admirable studio.

"A VERY OLD PHOTOGRAPHER" has been trying a printing-bath containing ten grains each of the nitrates of uranium and silver to the ounce, but has not been able to succeed in getting presentable prints, those obtained being mottled and red. He is desirous that some reader would oblige him with a formula for a weak silver bath by which, with the aid of uranium, good prints may be obtained.

M. M. SCOTT.—To make the map quite flat place it for a few hours in a damp cellar, or even sponge the back with water, and then paste it by the edges to a frame. When dry it will be in the proper condition for being photographed. See that it be illuminated by either a diffused light or by a light falling upon it from the front; a side light is to be avoided. Let the negative be very intense, and the albumen of the transfer sheet be undiluted.

OXONIAN.—1. There are no definite proportions necessary in the preparation of the cement, because for some purposes it must be thicker than for others. The most useful consistence is that of a thick sample of collodion.—2. We are not acquainted with the formula to which allusion is made; but we always understood that full directions were printed upon the labels of the collodion bottles. This used to be the case some years ago, at anyrate.

W. HORSEMAN KIRKBY (Waterloo) writes as follows:—"I should be much obliged for some advice as to a lamp for my lantern, which at present is without one. The condensers are three and a-half inches. 1. Would you recommend a *Silber* argand lamp?—2. Or a double-flat-wick petroleum?—3. Is there any danger from explosion, the lantern, being metal, getting very hot? I intend printing some transparencies from it, but I do not care to go to the expense of the lime light."——Replies: 1 and 2. A Silber or, indeed, any form of argand lamp is preferable to the double-flat-wick petroleum, if by this term be meant the "duplex lamp." The latter emits a fine, steady light; but the greater intensity of the argand lamp renders *it* the better of the two for the lantern.—3. There *is* danger of explosion if the reservoir be allowed to become too hot. A plate of tinware or a false bottom may be interposed with advantage between the burner and the reservoir; but the latter should always be surrounded by a current of cold air. It is much better when kept outside the lantern.

PUTTING NAMES ON NEGATIVES.—We have received the following:—"IGNORAMUS (Green Isle) would esteem it a favour if you would kindly say the *best* way of placing the name on a negative so that *all* would print together, as we find our pictures pirated so grossly that we are compelled to have our names on the photograph. Although we have put cautions in the newspapers, it is all of no avail. Two hundred of our large views have been passing as the work of another photographer. By explaining a distinct and *easy* mode of having our names placed so as to print *with* the picture you will greatly oblige."——In reply: Several eminent photographers adopt the plan of writing, or neatly printing with a pen, the name of the subject, its catalogue number, and in some instances their own initials on the film, anywhere in the foreground. This prints white, and saves further writing or printing upon the mount of the picture. Of course the ink used must be quite opaque, and the writing must be reversed. China ink answers well, and we believe it is generally used for this purpose. If, in writing, there is a repellent action between the film and the ink, such "greasiness" may be readily destroyed by the application of the tongue. If any difficulty be experienced in writing backward the following plan may be adopted:—Write in the usual or non-reversed way on smooth, fine paper with *copying* ink having a good body. The addition of a little gum water and sugar will render any ink suitable for this purpose. Then "set off" this writing on to the negative by means of pressure with a paper-knife, and should the opacity be insufficient apply, while the writing is still "tacky," a little lampblack or other powder by means of a tuft of cotton.

REV. CANON BEECHEY.—Received. Thanks. In our next.

TILLEY'S COMBINATION PRINTS.—We have received from Mr. Tilley several examples of combination printing executed by the patent process we described a fortnight since. These are exceedingly perfect, and speak very eloquently on behalf of the process by which they were executed.

ROYAL CORNWALL POLYTECHNIC SOCIETY.—In the report sent to us of the prizes awarded in the photographic department of this energetic Society, and which was published last week, the works of Colonel Stuart Wortley were named among the "professionals." This, the Secretary informs us, was by mistake, that gentleman's photographs being classed as an amateur's productions.

CONTENTS

# THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 804. Vol. XXII.—OCTOBER 1, 1875.


## READINESS, SIMPLICITY, AND STANDARD QUALITY IN DRY PLATES: PRACTICAL DIRECTIONS.

Without detracting in the least from the value of very rapid or very long-keeping dry plates under special circumstances, what the generality of amateurs want is to be able at a short notice and at any time to make a batch of dry plates for a journey with little trouble, uniformity of quality, and certainty of success. For this purpose it is safest to exclude both extremes of rapidity and slowness. Sufficient rapidity, combined with printing density, brilliant clearness, good keeping quality, and easy, unfogging development are, in our opinion, the desiderata in the amateur's standard dry plates.

A few days ago we were shown by Canon Beechey a negative possessing excellent qualities, which had been obtained by him on a plate with respect to the preparation of which he at the time gave us an outline. He further left with us for trial, at our leisure, two plates prepared by him in a similar manner. These, upon being exposed and developed, yielded us such fine negatives that we immediately wrote to Canon Beechey, requesting him to kindly furnish ourselves and readers with details of his method of preparing the plates; for, as the negatives were very bright, full of detail, and developed up to full intensity without trouble—the plates, moreover, being sensitive—we felt it desirable that the process should be generally known. With the greatest promptitude Canon Beechey has responded, and has given us the fullest details. From a perusal of these we are led to believe he has reduced the difficulty of preparation to a minimum. The directions are subjoined. He says:—

1. Always have in stock the following articles:—

| | |
|---|---|
| Absolute ether | 1 pint. |
| Absolute alcohol | 1 ,, |
| Alcohol, ·820 | 1 ,, |
| Hydrochloric acid | 1 ,, |
| (The latter is as useful in cleaning the plates for albumenising as for the emulsion.) | |
| Gun cotton of suitable quality, at least | 1 ounce. |
| Bromide of cadmium | 1 ,, |
| Pyrogallic acid | 1 ,, |
| Fused nitrate of silver in powder | 1 ,, |

The above constitute all the chemicals employed in the manufacture of these plates.

2. Have also in stock, ready for use at any moment *(a)*, at least two dozen properly albumenised plates, and *(b)* a stock bottle—say eight ounces—of the following bromide solution:—In eight ounces of absolute alcohol dissolve five drachms of anhydrous bromide of cadmium. The solution will be milky. Let it stand at least twenty-four hours, or until perfectly clear. It will deposit a white powder. Decant it carefully into an eight-ounce vial, and add to it one drachm of strong hydrochloric acid. Label it "bromide solution." It is as well to add on the label the constituents, which will now be found to be *nearly*—

| | |
|---|---|
| Alcohol | 1 ounce. |
| Bromide of cadmium | 32 grains. |
| Hydrochloric acid | 8 drops. |

This solution will keep for ever, and be sufficient to last the amateur two or three years. With it at hand he is now able in two days to prepare a batch of plates at any time. In doing so he will proceed thus:—

3. Settle how many plates you mean to make, and take of the above accordingly. For two dozen half-plates ($6\frac{1}{2} \times 4\frac{3}{4}$) *(a)* dissolve by heat over (but not too near) a spirit lamp, and by a yellow light,* forty grains of nitrate of silver in one ounce of alcohol, ·820. Whilst this is dissolving in a little Florence flask, on a retort stand at a safe distance from the lamp (which it will do in about five minutes), take of the—

| | |
|---|---|
| *(b)* Bromised solution | $\frac{1}{2}$ ounce. |
| Absolute ether | 1 ,, |
| Gun cotton | 12 grains. |

Put these into a clean bottle, shake once or twice, and the gun cotton, if good, will entirely dissolve. As soon as the silver is *all* dissolved, and whilst quite hot, pour out the above bromised collodion into a clean four-ounce measure, having ready in it a clean slip of glass. Pour into it the hot solution of nitrate of silver in a continuous stream, stirring rapidly all the while with the glass rod. The result will be a perfectly-smooth emulsion without lumps or deposit, containing, with sufficient exactitude for all practical purposes, eight grains of bromide, sixteen grains of nitrate of silver, and two drops of hydrochloric acid per ounce. Put this into your stock emulsion bottle and keep it in a dark place at least twenty-four hours. When first put in it will be *milky;* when taken out it will be *creamy.* It is well to shake it once or twice in the course of the twenty-four hours; but I do not always do so.

4. At the end of twenty-four hours you can make your two dozen half-plates in little more than an hour. Proceed as follows:—Have two porcelain dishes large enough to hold six (or four, *at least)* of your plates. Into one put sufficient clean, filtered rain water to nearly fill it. Into the other put thirty ounces (a pint and a-half) of clear, flat (not acid) table beer, in which you have dissolved thirty grains of pyrogallic acid. I really do not know a simpler or more satisfactory preservative than the above. I like to use bitter beer at one shilling per gallon. The pyro. dissolves in it at once. Pour it through a filter into the dish, the neck of the funnel being within half-an-inch of the bottom, to avoid bubbles. If allowed to let stand an hour any beer will be flat enough. If the beer be at all *brisk* it will be difficult to avoid little bubbles on the plates. At all events, let your preservative stand whilst you filter your emulsion. This must be done through cotton-wool into a perfectly-clean collodion bottle. Give the emulsion a good shaking, and when all bubbles have subsided pour it into the funnel and it will all go through in five minutes.

The filtered emulsion will be found to be a soft, smooth, creamy fluid, flowing easily and equally over the plates. Coat with it six plates in succession (if your dishes will hold six), and place each as you coat it in the water. By the time the sixth is in the first will be ready to come out. Take it out, see that all greasiness is gone, and place it in the preservative. Coat another plate and put it in the water where the first came out. Remove your second plate from the water into the preservative, and in its place lay another freshly-coated plate, and so on until the first six are all in the preservative and six more in the water. You now take the first plate out of the preservative into your drying-box, and again remove the first out of the water into the vacant place in the preservative. Coat another and put it into the vacant place in the water. Take your second plate out of the preservative into the drying-box and the second out of the water into the preservative, and so on till all your plates are through the process and locked up safely in the drying-box. By proceeding as above not a moment of time is lost, and yet each plate soaks sufficiently in the water and in

* If ordinary bromide be used, thirty-two grains of silver will be sufficient.

the preservative. You will find an hour, if you are dexterous, sufficient time for two dozen plates.

As it is my wish to render this process so practical and simple that amateurs may make their own plates the following particulars as to material, exposure, and development will not be *de trop* :—

1. As to materials: I recommend all to be got from some eminent photographic chemist. There are many such: in every large town at least one. I obtained my pyroxyline from Mr. Rouch, of Norfolk-street, who also made my drying-box from my instructions, than which nothing can work better. It holds twenty-four half-plates, has a sheet-iron bottom, with air-tubes supplying hot, fresh air between every two plates. I generally make my plates at night, and when they are all in the rack and locked up I light a spirit lamp, containing one ounce of methylated spirit, under the drying-box, and go to bed. In the morning I may pack up my plates and set out on my expedition, confident that I have two dozen reliable dry plates.

2. As to exposure: these plates do not profess to be *very* rapid, but they are sufficiently so for every ordinary purpose. From thirty to sixty seconds according to light will be enough, but they will do with less and bear strong ammonia development without fogging; or they will do with more, the development being stopped sooner. Unless you take with you the means of developing it is better to try a plate before you start. In spite of every precaution there will somehow be a difference in a batch of plates now and then. I may mention, also, that I never back my plates, for the reason that I never find they require it. They will not blur with any light that will not also blur backed plates.

3. For developing I use Colonel Wortley's strong developer. I mean the one published with his excellent rapid uranium plates, which I copy:—

| | | |
|---|---|---|
| A. | Pyrogallic acid | 96 grains. |
| | Alcohol | 1 ounce. |
| B. | Bromide of potash | 12 grains. |
| | Water | 1 ounce. |
| C. | Carbonate of ammonia | 64 grains. |
| | Hot water | 1 ounce. |

By all means use *carbonate* of ammonia. The liquid ammonia often destroys a good negative, and always gives a more inky picture. For a half-plate take of A thirty drops, of B sixty drops, of C two drachms, or even three if the exposure be short. I never use any alcohol, but simply wet the plate well under the tap, thereby washing off the beer, and pour on the developer. The picture will come out in a few seconds. On its first appearance pour back the developer into the measure and let the picture come out of itself. You will be surprised to see how it *will* come out. You can then judge as to exposure and proceed accordingly, adding bromide if too rapid, or pouring on the developer as it was if all right, or with an extra thirty drops of C if under-exposed. These plates seldom require to be intensified. If they do the ordinary acid silver and pyro. redeveloper will bring them up easily and at once. Clear with either hypo. or cyanide as you please, and if you intensify do it after clearing; but the beer gives these plates a bottle-green tint, which is more impervious to actinic light than from its transparency you would suppose.

These plates are more rapid if placed at once in the preservative without washing; but they require to stay in till all greasiness has disappeared, and I doubt if they keep as well or are so certain. To wash first is safest for amateurs.

In conclusion: I am glad you have asked me for the above formulæ, since I have had more letters inquiring for them than I could find time to answer. I claim nothing new in the process but the beer and pyro. developer. You know I am a pupil of Colonel Wortley, and my process is essentially his applied to a humbler and more domestic class of plates. I have tried to simplify their preparation for amateurs, and I am quite sure ninety-nine out of a hundred will prefer them to the host of complications which from time to time "go up like a rocket and come down like the stick."

To the foregoing lucid directions we have only to add an expression of thanks to our reverend friend for the readiness with which he has responded to the request we preferred in the interests of the photographic fraternity.

## THE LESSONS OF THE PHOTOGRAPHIC EXHIBITION.

### I.—Talbotype Possibilities.

Much has been written with regard to the qualities required in any negative which is to be submitted to the crucial experiment of being used in the production of an enlargement. We have been told how that the shadows must be transparent and wanting in density, how that the lights must be very pure, how that the collodion should be structureless, and so forth. But into whose mind the idea first entered of producing an enlargement from a *paper* negative, and who was the bold individual who carried it into actual practice, we are not aware. That such an apparently difficult task has been accomplished, and that, too, in a highly-successful manner, is an undoubted fact. The evidence of this will be found in the fine collection of photographs which grace the walls of the Gallery of the Society of Painters in Water Colours, and now being exhibited under the auspices of the Photographic Society of Great Britain.

Nos. 273 and 311 respectively are good and effective carbon *enlargements*, of the dimensions of about twenty-four by twenty inches, produced from Talbotype paper negatives by Mr. B. B. Turner. That these negatives are not of the modern school, or taken with special reference to subsequent enlargement, will be at once apparent when we state that prints from them were displayed at the first exhibition of the London Photographic Society, held in 1854, or upwards of twenty years ago. One of these, *Scotch Firs, Hawkhurst*, will bear comparison with many enlargements from collodion, although there is a certain degree of granularity in the whites, which, however, is very far from being unpleasant or objectionable.

It is a fact to which we have frequently alluded that a carefully-prepared sheet of sensitive paper will yield a negative from which prints may be obtained bearing favourable comparison with collodion negatives. For very small work there would, of course, be a difference immediately apparent; but for large pictures, in which minute examination is not courted or desired, other qualities exist in the print from the paper negative that counterbalance those arising from microscopic definition.

Since examining the pictures in the Exhibition to which reference is here made we have looked over some of our old paper negatives as well as prints from such negatives, and find that many of both bear examination through a powerful hand magnifier without showing any falling off in detail. It is evident that these would certainly bear being enlarged two or three diameters without any loss of sharpness. Among the prints now before us is one of *Lacock Abbey*, by Mr. Fox Talbot. This ancient building should be famous in the history of landscape or architectural photography, inasmuch as it is the first "that was ever yet known to have drawn its own picture," as was stated in the *Transactions* of the Royal Society for January, 1839. It was four years previous to this date when this ancient religious structure (now the residence of Mr. Talbot) performed the celebrated artistic feat in question. This picture, from a paper negative, is quite as sharp as a large proportion of the landscapes from collodion negatives to be seen in the present Exhibition.

As it is a matter to be regretted that such a process, possessing as it does so many conveniences, should not be tried, and subjected to the improvements introduced of late in connection with bromide of silver and pyrogallic development, we here subjoin a "working outline" of the Talbotype process sufficient to enable any careful experimentalist to produce pictures which will amply repay the trouble he may experience in departing from the routine of collodion practice.

In a pint of water dissolve 160 grains of iodide of potassium and fifty grains of bromide of potassium. Upon this float for half-a-minute a thin, very close-grained, and well-sized paper. Paper thus salted will keep well. To render it sensitive brush it over with, or float it upon, a forty-grain solution of nitrate of silver containing half-a-drachm of glacial acetic acid to each ounce of solution. The acid must on no account be omitted, otherwise the picture will be fogged. If fogging do take place, it is an indication that the acetic acid has either been too weak or that it has been added in insufficient quantity. If the greatest degree of sensitiveness be desired the paper should, on being removed from the silver bath, be partially dried between two folds of blotting-paper and exposed while moist. In this condition it is sufficiently sensitive to enable instantaneous views of a well-lighted subject to be obtained with a quick-acting lens. Portraits also may be taken. When in this highly-sensitive condition the paper will not keep good for any considerable time; but, by floating it upon a bath of plain water, keeping properties

may be imparted for any time proportionate to the amount of washing it receives. As the sensitiveness is greater while the paper is moist than after it has become dry, means are usually adopted to retain it in this moist state. The most obvious of these is the enclosing of the paper in a tight case contiguous to a moist sheet of blotting-paper. The development is effected by immersing it in a three-grain solution of gallic acid, the action of which is greatly intensified by the addition of a few drops of the aceto-nitrate of silver bath upon which the paper was sensitised. In development, the same rule here holds good as is applied in the case of a collodion negative: use the silver very sparingly, or too great intensity will assuredly result. Fix in hyposulphite of soda. To increase the transparency of the paper it is usual to wax it. Instead of dissolving the iodide and bromide in plain water it is often advantageous to do so in water containing a little organic matter, such as gelatine.

Already have successful steps been taken to prepare negative paper with collodio-bromide and gelatino-bromide; and as the picture, with these agents, is kept entirely on the surface of the paper—which is in this case merely the vehicle for sustaining the film—we look forward to seeing, at no distant period, enlargements being obtained from such negatives on paper—not paper negatives—as will *entirely* rival those obtained on glass. Meanwhile, as there is an exceptional charm in large landscapes printed from Talbotype negatives, we recommend an occasional return to this oldest method of producing negatives. In conclusion: we may add that we think the demonstration given of the capabilities or possibilities of this process by the carbon enlargements which form the theme of our remarks is justly entitled to a chief position among the lessons taught by the present photographic exhibition.

## THE MANUFACTURE OF GELATINE.

In continuation of our article of last week, on the properties of gelatine, we think a short description of the method adopted in its manufacture may not be uninteresting, especially as we recently had an opportunity of examining the process as carried on at Gorgie, where the well-known "Cox's gelatine" is made.

The Gorgie works are situated about two miles to the west of Edinburgh, and extend for a considerable distance on each side of the old Glasgow road. The buildings generally are of the most primitive description, and cover—we are afraid to say how many acres. They are intersected by a stream of water, which is made to do duty in various ways, both as a force-producing and a cleansing agent. A single glance at the general appearance of the "works" reveals the fact that they have not been erected either at one time, on any specific plan, or for one particular purpose. In point of fact the buildings have been the growth of very many years, and have in their time been turned to various purposes. At one time there was "nothing like leather," and tanning and currying were carried on most extensively; at another, the water power was made available for grinding on an equally large scale. Recently, however, and more especially during the lifetime of the late Mr. John Cox, familiarly known to almost everybody in Scotland, and to a large number beyond the boundaries of that country, in connection with the "patent gymnasium," the manufacture has drifted into the well-recognised gelatine; and, if we may judge from the enthusiasm of its present proprietor, its high reputation is likely to be retained intact.

During our visit we had the great advantage of having the proprietor as our guide; and as he is not only most thoroughly acquainted with the whole process as carried on at his works, but has also acquired a very thorough scientific and technical knowledge of the substance produced, and, what is more to our purpose, was quite as willing to communicate as we were to learn, we think ourselves fairly entitled to state that the information about to be given may be accepted as strictly reliable.

Our first visit was naturally to the stores of raw materials, which we thought we had discovered in a series of huge, tarpaulin-covered, hay-rick-looking masses, sufficient, one might have presumed, to forage the Royal Horse Artillery for an unlimited period. Instead, however, of the contents being hay, we found them to consist of what resembled shag tobacco, but what was in reality the skins of various animals, such as rabbits, hares, and we do not know what else. Under other covers we found the skins of whole flocks of sheep compressed into the smallest possible compass—some looking clean and nice, and others both looking and smelling very much the reverse.

Here then, we thought, was good evidence that there was truth in the popular notion that the beautiful jellies so frequently seen on the dining-table had their origin in very questionable *matériel;* but an expression of this opinion was met by a quiet smile from Mr. Cox, with an assurance that, whatever other makers might do, he would soon convince us that "Cox's gelatine" was made from very different stuff, and that what we had seen was exclusively used in the production of glue, although of glue so good that he would defy any maker in the world to beat it in all the qualities constituting a good article.

Passing, then, what we suppose we may call the "skin ricks," we came to a series of covered sheds, in which were stored the true raw material of the gelatine, and which consisted entirely of the "roundings" of ox hides. The supplies are principally drawn from South America, and, as they had previously undergone a liming process, they were beautifully white and absolutely free from smell of any kind. A closer inspection showed that the pieces were principally the cheeks and portions of the neck; and, as we looked along the extensive ranges of sheds at the immense piles of materials they contained, some idea of the extent of the manufacture and of the capital involved in it could be formed, especially when we were told that it sometimes cost as much as eighty-two pounds per ton.

The necessity for keeping on hand a large stock of the raw material will be evident from the fact that the first part of the process consists in steeping the skins in lime water, to which has been added a little alum, for not less than six months. The process might be shortened by frequent manipulation, but the resulting article is not by any means so good. At the end of the six months the skins are removed from the pits, which are merely large square holes built of stone, and having their mouths on a level with the ground. The skins are thoroughly washed in pure water until every trace both of alum and lime are removed. They are then hung in the open air to dry, and, when perfectly so, are placed under cover in large buildings, ready for use and in a state to keep indefinitely without change.

The next stage of the process consists in steeping the prepared skins in water till they become pliable, after which they are forced against the revolving cutters of what looks precisely like, and for aught we know may be, an ordinary hay-cutter. By this means they are cut into thin shreds and are ready for the next stage, which is soaking again in perfectly clean water till they are quite soft and almost transparent. At this stage they look almost pure gelatine, and, in point of fact, are very nearly so.

At this stage of the operation it will be evident that perfectly pure water is required, as all that the skins take up goes with them into the coppers, and is afterwards run into the coolers to be driven off in the process of drying; therefore, whatever impurities the water contains in the shape of soluble salts remain in the finished gelatine. We have little doubt that many of the cases in which the delicate balance between the chromic oxides and the bases with which they are united is upset may be traced to such impurities in the gelatine where water of insufficient purity has been used.

The thoroughly-swollen shreds are next transferred to the "boilers," if such a term may be applied to vessels that are never allowed to boil. They consist of tinned copper vessels, about fifteen inches in diameter and thirty inches deep, terminating in a wide tube at the bottom, which comes out through the brickwork of the wall in which they are built. The tube has a tap at the lower end, which is opened and the gelatine allowed to run into copper pans, when the operations are complete. Surrounding the copper vessel is a cylinder of cast iron—a steam-jacket, in fact—which communicates with a large steam boiler, and this is, in turn, cased with wood, and has a cover of the same material to prevent the dissipation of the heat. About a dozen of such "boilers" are built side by side into a brick wall, and look exactly like a row of wooden tubs with the hoops as bright as those on the milk casks of a well-kept dairy.

The copper has first placed in it a bag or cylinder of a closely-woven cloth, in which the shreds are placed and which acts as a filter, keeping back all the solid and insoluble matter. Over the shreds is poured a little water; the wooden lid is then put on, the steam admitted, and the process goes on without further trouble, except the careful regulation of the temperature, which is indicated by thermometers placed in suitable positions. Upon the proper management of this part of the operation very much of the ultimate success depends, as it will be obvious that the lower the temperature at which the gelatine can be produced the better will be the quality of the finished article.

When the steaming has been completed the cocks are opened and the contents run into a row of copper pans, from which they are poured into coolers—wooden troughs about five feet long and nine inches square. The syrupy-looking liquid, when examined in thin films, seems absolutely colourless, but in mass is of a pale straw tint, and at the expiration of a few hours is so firm that it bears a strong blow of the open palm without receiving any impression. It is then turned out on the cutting-table and with a very primitive machine cut into ribbons of about half-an-inch thick, an inch and a-half broad, and five feet in length, and laid on frames of wood on which are stretched nets of twine. It is then placed in a stove where a constant current of warm, dry air is maintained until the ribbons have become perfectly dry and almost as brittle as glass. In this state it is made into bundles and is quite ready for the market.

Mr. Cox, however, sends very little of it out in this form, but seems to prefer it to go in the well-known packets covered with paper printed in coloured squares. For this purpose it requires to be cut into shreds, which is done very rapidly by a machine after being slightly moistened. After cutting it is again dried on cloth in a warm air stove, and transferred to the packing-room. Here are employed a considerable number of healthy-looking, well-dressed girls, under whose fingers the chip board, paper, and paste rapidly assume the form of square boxes, which are as rapidly filled with the cut gelatine and labelled. The packets are next made into dozen parcels and packed in casks ready for either the home or foreign trade.

## THE PHOTOGRAPHIC EXHIBITION.

The annual Exhibition of the Photographic Society of Great Britain was formally opened on Tuesday evening last by a *conversazione*, at which there was a large attendance of members, exhibitors, and their friends, a considerable number of ladies being present, despite a pluvial downpour.

It had been surmised that owing to the early period at which the Exhibition was to be held it would run serious risk of proving a failure; and it had also been anticipated that for the same reason—although why it should be so we cannot divine—several exhibitors would be unable to complete their works in time for the opening. Our very agreeable surprise, therefore, may be imagined when upon entering the gallery we found the walls tastefully and profusely covered by a most excellent and varied collection of photographs.

The eye of the visitor is immediately arrested by the number of enlarged landscapes in the room. This was one of the earliest forms in which enlargement was first suggested and even practised; but, from some cause or other, its practice has never become universal. During the past two or three years the enlargement of landscapes has been growing in popularity, and a demand for this class of work is now arising. The greater number than usual of enlargements in the Exhibition is a healthy sign of the times; and, with the improved facilities for their production now within reach of all, we trust that photographers, by the exhibition of choice works of the character referred to, will stimulate the demand and still further promote and form public taste in this direction.

Of enlarged portraits there is a considerable number, considering that there has been no incentive this year in the shape of medals or prizes. And this suggests the fact that conspicuous by their absence from this Exhibition are the names of some who, in previous years, have been associated with the exhibition of either enlarged or direct heads; for instance, Colonel Stuart Wortley, Messrs. Robinson and Cherrill, Ferranti and Turner, B. J. Edwards, and other well-known competitors of last year.

The pictures are very judiciously arranged, a departure having been made from the course hitherto adopted—that of hanging all the works of each exhibitor together. This change may prove inconvenient to those visitors who prefer to examine all the exhibits of each artist without having to move from one portion of the room to another; but there can be no doubt that the completeness and excellence of the Exhibition as a whole is enhanced by the present arrangement, large portraits not being now intermingled with small portraits or landscapes.

We see with much pleasure the works of several artists who have not before contributed; among these we give the place of honour to M. Davanne, the talented President of the Photographic Society of France. The name of this gentleman has for many years been so intimately associated with scientific investigations in connection with photography that there has been a tendency to overlook the fact of his being an artist and a skilful manipulator as well as a man of science. In a considerable number of charming works by the collodio-albumen process M. Davanne shows himself to be as accomplished an artist as he is facile as a writer.

While speaking of foreign works we must direct special attention to three large portraits by Herr Hugo Theile, of Dresden. There is a peculiar charm about these works which immediately commends them to the attentive examination of the connoisseur. They have received the well-merited distinction of being placed "on the line" at the upper end of the hall.

Mr. Crawshay, while contributing a few large portraits, appears this year in a new character—that of a landscapist. We may here observe, without anticipating such remarks as we shall afterwards make in detail on the pictures, that Mr. Crawshay's landscapes possess those pictorial qualities which must necessarily increase his high reputation as an artist.

Of photo-enamels the only exhibitor is Mr. R. Faulkner, whose works in this department are quite worthy of the reputation he has already acquired in other branches of photography. Mr. Faulkner also exhibits a large number of children's portraits, of which it is enough here to say that there is not a second-rate or mediocre picture in his collection.

Several portraits by Mr. Hawke, of Plymouth, possess such excellent qualities as to entitle that gentleman to one of the highest positions that can be awarded to any exhibitor.

Messrs. Blanchard, Bedford, Chaffin and Son, and England are well represented; while Mr. Viles sends the finest and largest contribution he has ever yet made to any exhibition.

As respects dimensions as well as numbers the distinguished firms of Spencer, Sawyer, Bird and Co. and the Woodbury Printing Company are the largest contributors; while a considerable array of fine works is also exhibited by the Royal Engineers, Chatham, and by Messrs. Mawdsley, Stoddart (of Margate), Brownrigg, H. Garrett Cocking, and Lombardi and Co.

Mr. George Hare exhibits a frame containing two photographs of great interest, one of them being a view of the New Palace of the Maharajah of Punnah, Bundelcund, India, taken by his Highness, who, by this picture, proves that he is quite as good a photographer as many of our home artists of greater pretensions if of less exalted rank. The other is a small portrait of his Highness himself, taken by his Prime Minister.

The only apparatus exhibited up to the present time consists of two of Hare's automatic changing-boxes with their accompanying dark slides. At the *conversazione* these changing-boxes were minutely examined by many of those present, who seemed greatly interested in the conjuror-like rapidity with which the plates could be passed to and fro from box to slide.

Several specimens of Lambertype and chromotype are exhibited by M. Lambert, and, as might have been anticipated, they challenge more than an ordinary amount of criticism. Messrs. Mayall (of Brighton), S. Thompson, Wyles and Co., Marion and Co., G. W. Wilson, Robinson and Thompson, Croughton, Dixon, Kennett, Young, Slingsby, Stillman, and Greaves (of Halifax) are among the exhibitors.

At the opening *conversazione* the opinion was freely expressed that the present Exhibition is the finest yet promoted by the London Photographic Society.

We shall next week commence a series of critical notices of the various works forming the present display.

## HINTS RELATING TO ALBUMENISED PLATES.

Whether for good or evil, the use of albumen as a substratum is taking the place of the old-fashioned but nevertheless useful "elbow grease." It is upon some of the conditions conducive to success that I venture to recapitulate some of those things I have found having that tendency.

As to the necessity of a substratum I will offer no opinion; still I may add that, in a practice involving the production of about forty to fifty half-plates for *cartes* per diem, the plates have been found to be perfectly cleaned with an immersion in dilute nitric acid, followed by copious washing and wiping dry with a *clean linen* cloth. The films produced on such plates were not found to require any extraordinary care in washing. However, to return. Plates which it is intended to albumenise are generally first subjected to the action of a detergent, such as nitric acid, then washed with water, and rubbed with a pad to remove adhering dirt; again washed, slightly drained, coated with dilute albumen, and dried. In reference to immersion in the dilute nitric acid no element of uncertainty can offer itself. In the second part some little niceties exist. If the plate be washed and rubbed at the same time—that is, if the rubbing with the pad be accomplished while the stream of water is running on the glass—a much cleaner plate will be obtained than when the washing and rubbing follow each other.

The importance of this apparently slight variation will be speedily discovered upon trial. It is not so easy as may be imagined to wash a surface like that of glass from all adhering dirt by simply allowing a stream of water to run thereon; yet, if a little friction be used while the water is streaming over the plate, all the particles of foreign matter will be speedily and surely removed, leaving a plate in its best state for albumenising. In this operation two vessels are used containing filtered albumen. A coat from the first carries off the superfluous water remaining on the plate, and the second gives a coating of a constant quality.

In this part of the business I have noticed a singular circumstance which I should scarcely have expected, viz., that the back of the plate gets a coating of albumen as well as the front. I was led to this conclusion owing to an accident. A particle of soot fell upon a plate, about the centre, just as the albumen was poured upon the upper part; the albumen carried the smut before it, and, instead of running off along with that portion of the fluid at the corner from which it was drained, it turned round and ascended the back of the plate, carried with a wave of albumen, about half-way up. Upon the application of the second coating the smut was carried still higher, and after the plate was dry the particle of soot was found almost at the extreme corner opposite that upon which the plate was drained. On another occasion it was found that the wrong side of the plates had been used upon subjects well calculated to test if the plates were clean, and no evil effects were observed. This shows the desirability—indeed, the necessity (if albumen be dissolved by the bath solution and is pernicious)—of giving the backs of the plates a thorough cleaning with a damp cloth before using. A damp chamois leather is a capital thing for this purpose.

A source of spots was found to proceed from imperfect washing away of the acid, the result being that clots, almost imperceptible, of coagulated albumen were formed, which, possibly, retained sufficient acid to cause spots of insensitiveness compared with the surrounding parts, and hence transparent spots. Whether this supposition be correct or not, these clots, when formed, result in such spots as described.

W. E. Batho.

## NOTES ON PASSING EVENTS.

By a Peripatetic Photographer.

The forty-fifth meeting of the British Association for the Advancement of Science is a thing of the past. So far as photography is concerned it does not appear to have been worse than its more immediate predecessors, for which there is this good reason—that such a thing was impossible. Bristol and Clifton are excellent places in their way—so, at least, say those who have been so fortunate as to have visited them. One is a hot-bed of commerce, the other a garden of delights; this can boast of merchant princes in profusion, and that of the perpetual presence of men renowned in science; here that which gratifies the heart of him whose aspirations are directed more peculiarly to the acquisition of wealth, and there scenery which is a *délice* to the lover of the beautiful in nature—a charming suburb, "not without art, but yet to nature true;" and yet not a solitary communication relating to photography could be evoked from a single denizen of this favoured city or of its more favoured suburban adjunct! The "reason why" photography is now to such an extent ignored among the transactions of the British Association is doubtless to be traced to the existence of photographic periodicals and photographic societies. All that is new now finds its way to the public through these channels, and each communication is at once placed before those capable of appreciating such points of novelty as it may possess; whereas in the British Association an ardent student in photographic art and science may be compelled to pour forth his long-cherished and carefully-elaborated ideas, theoretical or practical, to an audience composed of three staring old men, four schoolboys, and a bevy of fair dames from the neighbouring boarding-school, who attempt to look an interest that is belied by the ill-suppressed yawn. In the "good time coming," when a photographic congress will be held on the model of the Pharmaceutical Society and some other bodies, all this will be changed; meanwhile it will be seen what Glasgow can do towards imparting a little photographic interest to the next meeting.

In connection with the articles on the polarisation of light which have appeared in The British Journal of Photography, permit me to describe a pocket polariscope I have found very handy, and which I made at a cost of a few pence. I obtained a dozen of the thin circular glasses used for covering the objects on microscopic slides; and, having made their surfaces quite clean by wiping them with a dry wash leather on which had been sprinkled a little rouge, I placed them together in a pile, and then applied a straight edge to this pile in a slanting direction so as to force them to lie obliquely, similarly to the Leaning Tower of Pisa. A strip of gummed paper was now bound round the edges so as to secure the little parcel in this position, and the whole was then placed in a piece of tube about an inch in length. By this arrangement it will be seen that each plate of glass stands obliquely to the axis of the tube. This little instrument, simple and inexpensive though it be, suffices to show me all the commoner class of polarisation phenomena. For a long time I did not believe it could be used as a polariser for the *microscope*, and was so wedded to this opinion that I would not even make the trial necessary to determine this point; but I at last did so, and to my delight found that it makes a polariser not very much less effective than a costly Nicol's prism, which I have hitherto used for this purpose.

The process of putting backgrounds into negatives, and which has been patented by Mr. Tilley, is "bound" to effect the desired end. I have seen several prints from negatives prepared in accordance with his invention, and find that, although a certain space must necessarily intervene between the superposed printing transparency and the sensitive plate, yet the background produced by this transparency is exceedingly sharp. Indeed, I may go the length of saying that the backgrounds are far *too* sharp and "pronounced" for the sake of artistic effect. This, however, so far from being a drawback to the process is really its highest commendation; for it is self-evident that, when once the means of securing perfect sharpness is placed at one's disposal, any desired deviation from this may be adopted, all that is necessary being the farther separation of the *cliché* from the collodionised plate. By thus lowering the definition, and at the same time lowering the obtrusive vigour of the background, the gain to the picture, as respects artistic feeling, will be very great. With the means at one's disposal of introducing a background at once sharp and bold there may be a tendency, in the hands of some of our fraternity, to make what ought to have been a portrait in reality a landscape, having a figure in the foreground as an accessory. Such ideas passed through my mind as I examined two of Mr. Tilley's specimens.

About a fortnight ago, when I, accompanied by a friend from Bombay, was out for a day's photographic campaign in the vicinity of Tunbridge Wells, my said friend, upon "unlimbering" his camera, found that he had omitted to take with him the screw of the tripod head. What was to be done? Moralising on the importance of seeing that everything was in its place before starting from home could evidently do no good at such a moment. Its importance was fully admitted; but, meanwhile, the problem to be solved was the securing of the camera to the stand in the absence of the proper screw with which to effect the purpose. Here is the way by which the difficulty was overcome, and I narrate it for the benefit of any

hapless individual who, in his journeyings to and fro with a camera, may some day find himself *minus* a screw. A piece of strong twine was doubled, the loop passed up through both triangle and camera screw-hole, and a small desk key passed through the loop. A penknife was next placed across the hole of the tripod top and the string knotted over it. By turning round the knife the string was twisted sufficiently tight to hold the tripod top to the camera with a degree of force which quite equalled that usually exerted by the ordinary screw. Still, it was very stupid to leave the screw behind!

The judges of the Photographic Department of the Royal Cornwall Polytechnic Exhibition have delivered their verdict—Chaffin and Sons, of Yeovil, again standing at the head of professional photographers. I say "again" with reference to their London triumph of last year. But will any kind friend tell me what is meant by the expression in the judges' report, where they recommend the committee to revise the prize list "in order more fully to meet the requirements of the rapid development of the art, as it is *fast becoming not merely a chemical science but a real fine art*, requiring the highest artistic culture," &c.? The "art" can scarcely be said to be *fast* becoming either a "chemical science" or a "real fine art;" for photography has for a score of years or more been classed among the applied sciences, and some of its outcomings have for as long a period been ranked among the works of fine art. In short, it has for many many years received the happy designation of the "art-science" of photography.

## EFFECT OF THE COLOURATION OF THE COLLODION FILM UPON ITS SENSITIVENESS TO RED LIGHT.

In our issue of September 17th, at page 450, we published a communication on this subject from Captain Waterhouse, with reference to which we have received the following from the same gentleman by way of addendum:—

Since writing to you on the 17th it has occurred to me that in the hurry of writing to catch the mail I expressed myself rather more positively than I intended when writing the latter part of the sentence—"There can, therefore, I think, be no doubt of the action of the dye, and that Dr. Vogel is correct in his theory." Of the action of the dye I have no doubt, but I cannot pretend to have proved the truth of Dr. Vogel's theory from a single trial.

Later experiments appear to show that, although several of the aniline dyes undoubtedly have an influence in increasing the sensibility of bromide of silver for the less refrangible rays of the spectrum, the absorptive effects of different dyes are not so distinctly marked as the results obtained by Dr. Vogel had led me to expect. I must, therefore, reserve any opinion as to the correctness of Dr. Vogel's theory till further experiments have given me a fuller insight into the subject. J. Waterhouse.

## FOREIGN NOTES AND NEWS.

Extraordinary Meeting of the Berlin Photographic Society.—"Stuart Wortley" Dry Plates.—Marbly Stains.—Aubeldruck and Hans' Zincographs.—Messrs. J. Malloch & Co.'s Etchings on Glass.—Photo-Mechanical Printing at the Brussels Exhibition.—Next Year's Exhibition of the Photographic Society of France.—The Belgian Photographic Association.

An extraordinary meeting of the Berlin Photographic Society was called in order to arrange as to the amount of space likely to be required by that body at the forthcoming exhibition at Philadelphia, and it was finally settled that one hundred square metres would be sufficient. The Vienna Society has applied for one hundred and fifty.

The President laid on the table a copy of the newly-printed rules of the Society and a number of exchange journals, amongst which the July number of the *Philadelphia Photographer* attracted attention from its containing a female portrait in the new American style known as "promenade" portraits. The greater number of those present considered this size of picture too high in proportion to its width, and not likely to become popular in Germany. The President was of opinion that a shorter form of the same breadth could be used with advantage in the case of slender persons.

The young Photographic Society of Bremen intimated by letter that its transactions would in future be published in the *Wochenblatt.*

Herr Lindner then showed an enlargement from a *carte-de-visite* whole-figure portrait of a child, furnished by Herr Harnecker, of Wriezen. Herr Lindner reminded the members that he had once before showed them an enlargement of Harnecker's, about which the Society professed itself unable to form any opinion because it was much retouched. This was his reason for showing the present enlargement without retouching. The negative was, however, retouched, the pencil marks showing as thick strokes in the enlargement. The meeting pronounced Herr Harnecker's work excellent.

Herr Kunze laid on the table a few uranium dry plates exposed and developed by Herr Schlicht, of Potsdam. They were pronounced faultless, and quite equal to wet plates. Herr Kunze said the customs' officers had insisted upon seeing the imported plates, but at length they were persuaded to look at them in a darkened cellar. He also said that Herr Schlicht found the sensitiveness of the plates diminished with time.

Dr. Vogel spoke in confirmation of this statement. He found that faultless pictures were generally obtained with these plates; yet from the effects of the long journey, and also, perhaps, of the heat, the dry plates he took with him to the Nicobar Islands not only became less sensitive, but acquired other faults, such as spottiness. This was still more strongly demonstrated in the case of the dry plates Herr Hildebrandt took with him on his present African journey, a number of which he had exposed and sent to Dr. Vogel to be developed. Between the exposure and development some eight to twelve weeks had elapsed, and in the interval, whether induced by the change of climate or not, insensitive spots had appeared. These spots remained clear and refused to be developed; still the pictures were to a certain extent useable for scientific purposes.

Herr O. Lindner then made some observations on the well-known, white, marble-like stains, sometimes erroneously called "dry spots," occasionally visible when one looks through a plate. Herr Grüne had in his time removed these stains by licking them off. He did not like to do that; but he had succeeded in removing them from the film after it had been varnished, either by treating the varnished film with powdered sepia as for pencil retouching, or else by rubbing it smooth with his bare finger. He had twice tried, and each time succeeded in removing the varnish and the underlying marble stains from the particular spots treated in this way without injury to the picture, but he was unable to say whether or not this method would always be successful. Of course the rubbing must be stopped at the proper time and the negative should be revarnished.

Herr Quidde remarked that the stains appeared in different ways, and had various origins. He considered the chemical action of the wood of the dark slide to be the principal cause, for when he used one of his dark slides this blemish made its appearance much oftener than with others. It appeared most frequently with a new dark slide, and to guard against it he used the common precautions of coating the dark slide with asphalte varnish, and laying in fresh blotting-paper with each plate, to protect the part that comes in contact with the dark slide. A strong silver bath, long exposure, and great heat promote the outbreak of these spots as well as of the true dry spots (small crystalline flecks of dried-in silver salt), and usually the means that will remove the one will also remove the other—weakening the silver bath and damping the interior of the camera, &c. Sometimes the fault seemed to lie with the chemicals, such as the collodion (Herr Lindner has frequently been annoyed in this manner when his silver bath was quite fresh). The real dry spots seem in most cases quite distinguishable from the marble stains, as they make their appearance even in the oldest dark slides and with the shortest exposure; and while they are sometimes quite isolated in the middle of the plate and long and stringy, and sometimes dotted all over the plate, the stains are massy at the corner of the plate and spread more thinly towards the middle. What will effect their removal depends in a great measure on their intensity. Sometimes they are scarcely noticeable except one looks across the plate; sometimes they are easily removed with the tongue and leave no trace behind; at other times they leave a transparent spot; and others, again, are still more obstinate, and not to be removed at all.

Herr Wenske thought the number of these spots might be greatly diminished if the silvered plate were allowed to drip carefully before being placed in the dark slide.

Dr. Vogel was of the same opinion. He did not think the marbly stains originated with the wood of the dark slide, as he had seen them in plates that had not been in contact with wood at all. The wood-stained spots, he thought, had a more mossy and wreathy appearance. He further remarked that at present he had a collodion with which the marbly stains seemed unavoidable; in the silver bath it gave a greasy, repellent film.

Herr O. Lindner recommended the addition of water to such a collodion.

Herr Talbot showed a collection of lichtdrucks by Jacobi and Neuedorf, which need not have feared comparison with the best of their kind. The printing of these pictures do not seem to present much more difficulty than the common silver process, Jacobi's printing-staff being entirely composed of ordinary male and female photographic assistants. Some admirable specimens of Relvas' work were also shown.

The President then tabled a sheet with a large number of Aubeldrucks sent by Herren Aubel and Kaiser. The sheet contained reproductions in miniature of the title-pages of all the German illustrated papers, and was much admired on account of the fineness of the details.

After the close of the meeting Herr Hans, jun., son of the zincographer of that name, showed a number of specimens of the work produced at his father's establishment. These were pictures, tickets, &c., printed in imitation of lithographs and woodcuts—some in monochrome and some in a variety of colours. Those in the style of line engravings were the best, but there was a creditable amount of half-tone in the simulated crayon drawings. Of this last sort a printing-plate was shown. The plates in relief were etched by sulphuric acid, and Herr Hans said that they often drew 50,000 impressions, or even more, from a single one. He also exhibited a printing-plate prepared with the assistance of the Aubeldruck process and a print from the same. Plates of this description are obtained by sending a picture of which a copy either enlarged, reduced, or of the same size is desired, along with a burnished zinc plate, to Herr Aubel. The latter produces on the plate a copy of the original capable of withstanding the action of acid. After that Herr Hans etches the plate so that the drawing stands in relief and can be printed from like letterpress in an ordinary printing-press. It is said that these plates can be produced much cheaper than woodcuts.

The German photographic journals in their endeavours to solve the mystery of Herr Aubel's process have lately been reviewing various methods of combining photography with etching on glass. While they are speculating on the subject an Edinburgh firm has reduced to practice an ingenious method of glass engraving which may or may not be the explanation of the mystery they are investigating. Messrs. J. Malloch and Co., Lawnmarket, Edinburgh, have just brought out some views of Old Edinburgh engraved on glass and finished by a photolithographic process. A sheet of perfectly-smooth plate glass is coated with a yellowish, translucent pigment. The pigment is etched upon with a needle in the usual way, its advantage consisting in the facility with which the engraver can judge of the progress and quality of his work by laying the plate against a dark background or looking through it as one does with an ordinary photographic negative. It is then reproduced with remarkable sharpness; in fact, we have heard it said that the prints might easily be mistaken for impressions from copper plates.

The *Moniteur*, in speaking of the photographic exhibition recently open at Brussels, mentions the names of Messrs. Spencer, Sawyer, Bird and Co., of London, MM. Brauneck and Maier, of Mayence, Rommeler and Jonas, of Dresden, and Blockhouse, of Brussels, as being specially noticeable in connection with the various branches of photo-mechanical printing. While giving the palm for excellence, in an artistic point of view, to the English autotype productions above referred to, regret is expressed that no information is given as to the capabilities of the process in turning out proofs in large numbers. MM. Brauneck and Maier, on the other hand, are complimented on the manner in which they have in all cases attached the fullest particulars as to the means of production to each of their specimens. These gentlemen are said to have discovered a method by which they can turn out proofs at least ten times as rapidly as by means of the ordinary hand-press; and it is remarked that their prints exhibit evidence of an entirely different mode of printing from those in ordinary use. The printing is effected by means of a cylinder machine, and some peculiarity in the details enables them to produce perfect impressions with much greater rapidity than is possible by any other process.

The announcement is made by the President of the Photographic Society of France that permission has been accorded by M. le Comte de Cardaillac, the Director of Public Buildings, to hold the Exhibition, in 1876, in the south-west gallery of the Palais de l'Industrie. The exhibition will be open from the first of May to the thirty-first of July.

At the last general sitting of the *Association Belge* the treasurer's balance sheet was read, showing the Association to be in a very prosperous condition. Though it has only been in existence for one year, and has published during that time an elaborately-got-up *Bulletin* containing reports of its meetings, and an illustration each month, the treasurer holds a balance in hand for the year of more than two thousand francs. The Association is governed by a committee of eleven, including the usual officers, and is under the patronage of His Majesty the King of the Belgians. It numbers two hundred and ten working members, exclusive of about thirty honorary and corresponding members.

## THE BELGIAN MEDAL AWARDS.

The list of those to whom medals have been awarded by the *Association Belge de Photographie* has just been published. We find that a considerable number of these coveted awards have been made.

The gold medal for excellence, presented by His Majesty Leopold II., has been awarded to M. H. Rousselon, of the firm of MM. Goupil and Co., for his photographic engravings and reproductions.

The silver medal for photographic engraving, offered by M. G. De Vylder, President of the Association, has been secured by M. Adalbert Franz, of Vienna.

Silver medals have been awarded to Messrs. Spencer, Sawyer, Bird and Co. for their mechanical prints and enlargements; to Mr. W. B. Woodbury for his permanent prints and transparencies; to M. Braun, of Dornach, for prints in carbon; to the Scovill Manufacturing Company, New York, for photographic apparatus; to Herren Stender and Co., of Lamspringe, Hanover, for photographic enamels; and to Herr Haack, of Vienna, for reproductions in photo-lithography and photographic engraving.

Bronze medals have been awarded to Mr. Ogier, of Jersey, for enlargements in carbon; to Mr. A. L. Henderson, of London, for photographic enamels; to Captain Abney for his views of the transit of Venus; to Mr. George Hare, of London, for his automatic changing-box and stereoscopic camera; and to Messrs. E. and H. T. Anthony and Co., of New York, for a new form of stereoscope.

Silver and bronze medals have been granted for the best portraits and landscapes on albumenised paper. In portraiture Herr Angerer, of Vienna, M. Denier, of St. Petersburgh, Mr. Gutekunst, of Philadelphia, and Herr Heiler, of Hildesheim, are the fortunate recipients. In landscapes MM. Levy and Co., of Paris, Herr Haertwig, of Magdeburg, and Herr Remelé have received the silver medals.

Several bronze medals have also been presented, but to no portraitist in this country or America has one been awarded. In the bronze medals given for studies from nature, three out of the fourteen in this department have been received by artists on this side of the "silver streak," viz., by Messrs. York, of London, Brownrigg, of Dublin, and Hedges, of Lytham.

The members of the jury were M. Leon Vidal, of Marseilles, Herr Fritz Luckhardt, of Vienna, and Herr Schaarwachter, of Berlin.

From the foregoing it will be seen that a very fair proportion of the medals awarded have been received by artists with whose names our readers are familiar.

## OUR CLUB.

### No. XIII.—The Fair.

The fair days came, and, like the rest of the working-classes, we struck work, laid aside our traps, and "went in" for a little play. The village fair is a great event. It is astonishing to find the amount of zeal thrown into the preparations for the annual fair and gymnastic-game entertainment. The villagers' holidays being few and far between it turns out one of the great days of the year—a day from which they date the lesser events, and there is certainly no lack of "going in" for vigorous enjoyment as long as it lasts.

It has been said that no matter what part of the world you set foot in you are sure to find a Scotchman there; so with equal truth it might be said that not a fair or a feeing market takes place round all the country side without hosts of photographers dancing attendance —a caste that might safely be termed "dwellers in tents." They are everlastingly making shifts, as well as pictures, for a living, going on from year to year, travelling from place to place, in good luck and bad luck, yet never bettering their positions. Coming and going they live in it and die in it, and in most cases never get beyond the taking of a glass picture. Scarcely one of these can read or write, and their education seems to extend to their "'cute" knowledge of the value of money. I calculate they know how far five shillings will carry them, and how much it must bring them in. Lots of money could be made at this going-from-town-to-town profession; but, like many in better

positions, they live up to their incomes. As we were doing a walk through the tents we met one man who told us that he, in conjunction with two "pals," made seventeen pounds in three days—each working in a separate tent, of course. Taking into consideration all they had to pay for *matériel*—the most expensive articles of which are trays, mats, preserves, and glass—they could not have netted less than twelve pounds between them of clear profits. But there is no such thing as thrift amongst them. "Easy come, easy go;" they never make headway.

Whilst making a tour of these galleries of the "fine arts," and listening to the *art*ful talk of the hookers-in—those gentlemen who, standing in the doorway, proclaimed aloud the beauties of the productions to be had inside for "only one shilling," truthful representations of nature to be had only at *each* of the tents in the fair—we were enjoying this tall talk, when I observed a man come out of one of the tents, who, approaching where we were standing, accosted me.

"Good morning, Mr. Oute," he said. "You don't remember me?"

Well, you know, I hadn't forgotten this fellow, but his cool impudence took me rather aback. I looked and looked again before remarking—"I should know your face; but if you are the man I take you for, surely you would not dare to come and speak to me of all people in the world. Is Leisk your name?"

"Yes;" and he smiled the most innocent smile possible, as he continued—"I know I used you very badly, but I have suffered much and am a changed man since *then*."

Now, it is necessary that you should know something about the "*then*" to which he referred in order to understand what he meant, so I will tell you.

When at home one morning this Leisk called on me in a great state of distress, and told me he had come to town the previous night. He said he had received a letter from Edinburgh (whither he was journeying) informing him that his wife was lying dangerously ill, and that one or two of his children were also laid up with fever. He had not money enough to pay his fare, so, producing a camera and lens, he asked me if I would lend him a sovereign and he would leave them for a day or two, when he would send me the money, and I could return them to him again. The thing seemed all fair and square, so I took the camera and lens and handed him the sovereign. I received such a shower of blessings as he left me that I felt quite pleased with myself at being the means of conveying the charity bestowed. But during the day "a change came o'er the spirit of my dream." A gentleman, in company with a detective, called upon me, and asked me if a man named Leisk had visited my studio that morning. I told them he had, but that he had gone on to Edinburgh by train, as some of his family were ill, and he had received a letter to come at once.

My information caused the detective to purse his lips, and blow out that long, thin whistle peculiar to the class when they feel "sold." After a moment he said—"I wanted him. He knew he was wanted."

Not quite understanding the gentleman, he explained—

"You see, this gentleman and I have tracked him for ten miles. He has stolen a camera and lens."

"A camera and lens!" I exclaimed in astonishment.

"Yes. You see, he called on this gentleman yesterday—having found out by some means that he did a little in taking pictures, and telling the same cock-and-bull story that he has also evidently told you—and asked help; or if he could lend him a camera for an hour or two he knew where he could get a job, and he would rather make the money *with his own hands* than beg—a manly feeling; so he got the camera and lens, and, of course, 'hooked it.'"

"I am much obliged to you for your kindness," the gentleman said. "When is the first train for Edinburgh?"

"Stay a minute," I said, and I went into the studio and brought out the pledged goods. "This is your camera and lens, is it not?"

"Yes; that's it!" exclaimed the gentleman, smiling, as if he had met an old friend.

"How did you come by it?" inquired the detective, in a suspicious tone.

"Well, I'll tell you how I came by it," I replied. "This Leisk came to me in great distress and wanted a sovereign; so he left these till he returned the money."

"Can't be done!" said the detective, with a smile.

"Oh! if the camera is this gentleman's I don't wish to keep it."

It was rolled into a parcel and borne away.

So you can understand how I felt with regard to the smiling reformed one who stood before me.

Tom, turning to me, said—"Who is this man, Mark?"

"Why, that's the fellow I lent the sovereign to," I replied.

"Oh, ho!" cried Tom; "you're the cove wot bolted with the optic and box!"

"Do not speak of these things now that I am a changed man, sir." And, taking off his hat to me, he said—"I humbly beg your pardon, sir."

"Not much, that, for twenty shillings! Is it?" said Tom, laughing.

"'Tis all I have. 'I can no more, tho' poor the offering be,'" the knave repeated without a smile.

"No! do not call up the muse this morning. We are really not open to a swindle. Say how much money you would like and I will tell you if I shall give it you." Tom put his hand in his pocket as he spoke.

"Half-a-crown, sir, will do," said Leisk, rubbing the palms of his hands together.

"Say no more," Tom replied; "you shall have it if it were for nothing else than the fact that you took Mark Oute in."

Tom gave the waif the coin and he vanished. He would get very thirsty at once, I feel sure. Money has that effect on many folks.

Tom had a great fancy for sitting down amongst this class of people, and in a friendly conversation would get them to relate to him the lights and shadows of their ever-changing lives. He said he found more romance in their rough-told tales than in one-half of the books of fiction published. So, being in a "fair" and generous mood, he invited one-half of them up to his hotel to have a drink in the evening.

MARK OUTE.

## CULLINGS

### FROM THE SIXTH CONVENTION OF THE NATIONAL PHOTOGRAPHIC ASSOCIATION OF THE UNITED STATES.

IMPROVING NEGATIVES.—MR. BOWDISH:—A great many of my remarks in regard to retouching are, perhaps, too severe; perhaps I might reduce the thing and give a practical view of it. In retouching a negative you have to exercise great judgment. When I first began to retouch negatives I began to rough the surface of the negative, because that was the way in which I was taught. I afterwards found I could do it without making the surface rough. When you rough the surface of the negative for the purpose of retouching you will injure and destroy the brilliancy of the picture. If you are not able to retouch a negative without roughening the surface the better way is to make another. The most practical process I have ever found for retouching a negative was by the simple use of a pencil, without roughening the surface; in that way it would be almost impossible to over-retouch a negative. You cannot very well overdo it when you confine yourself to that. The object of retouching is to do away with defects; these, of course, are not seen when looking at a person from a short distance. We must take into consideration this one fact when we focus our camera. It is like taking a magnifying-glass and bringing it down upon a person. We get a result we never do in looking upon a person. We always look upon them at a distance—that is one reason why defects plainly showing in the negative do not show when looking at the person at a short distance; when the focus is brought down sharp to focus the face it delineates every line, and every imperfection of the face it magnifies. It does not look so in nature, because the person we are looking at is a short distance off. Now, the simple object of retouching is to soften the outlines of the picture—destroy those hard marks produced by chemical action. As I said before, it should be done by the simple use of the pencil, without roughening the negative and injuring the shadows; that is sufficient in retouching a negative. If we rough the surface of a negative we cannot always see just how much we are retouching, and the pencil is apt to take a little bit of the negative. Sometimes there is a white speck on the negative which we have to go over and retouch; this can be done by practice. I do not think it is true that it requires an artist to retouch a negative. One gentleman has said we must study up every artistic point; certainly we must. This cannot be done at first; it needs practice. I have no doubt you have had them come in and say they would like to learn the *trade*. The idea that it is a trade! Those who have this idea go to work, produce certain things with the camera, and think that they are artists; that is the idea they have. The consequence is they fall back, and there is a great many of that kind of artists, and they boast of it, the people not being able to discriminate between the work produced by them and the work produced by the artist. I say it is just as much the business of the photographer to be an artist as it is for the portrait painter. Then, study the lines and positions, and, as far as you can, control the expression. There is one drawback to photography, and that is, we cannot catch every pleasing expression of the face. We have certain subjects, and in them the expression has gone out of the face and it is a blank. The idea they have is—"I am sitting for my picture, and I must keep as straight a face on as I can." In my practice I have made a negative before telling them I was ready, while fixing my camera and talking to them. Suddenly, the negative was taken before they knew it. There was one old lady I recollect of, who came into my place. She was the mother of an Episcopal clergyman, who had urged her time after time to go and sit for her picture. I will express it when I say I told him her face looked like old crockery. The lady came into my place and sat for her picture. I placed her in the chair. I put my plate in my camera. I told her I was going to make everything ready, and while she was thinking of something else I exposed the plate. She fancied I was getting ready to take her picture, but the picture was already taken. I had uncovered the camera, I had exposed the plate, taken the negative into the dark room, and developed it. I found I had a negative sufficiently timed, and a very pleasing expression. I told her she could go. She exclaimed—"You have not got the picture!" I assured her I had. Then she would have it. It was not a good picture, but she was very well pleased with it—so much so that the result was I sold her sixty

dollars' worth of pictures; that was before crayon pictures were about. Now, I have a little device on my camera by which I expose the plate. It is done by means of a thumbscrew. I do not use a cap nor a head-cloth. I step back from my camera. I have a screen that shuts out the side light, and I have a little device by which I throw the screen or door over the back of the lens. This is very useful when you have to photograph light drapery, or something you want to photograph with a very great exposure of the plate. By the use of these devices you get your picture. You have attracted no attention, produced no unusual excitement, and you have got a good expression. You find that rule of procedure applies to older persons as well as to children. This I throw out as a hint. I have done away with the cap and the head-cloth. I find the head-cloth very disagreeable, especially in a very hot day.

Practical Suggestions.—Mr. D. H. Cross: I do not expect to write anything radically new or important, but would note a few modifications of the old process which I am at present practising with uniform good success. I have tried varying the strength of silver solutions for negatives, and have been surprised to see the extent of variation that can be successfully employed, and that, too, without any essential change of the collodion, developer, or manipulation. Forty grains of nitrate of silver is the maximum, and fifteen grains the minimum, to the ounce of water used. Both proportions were tried several weeks in succession on all kinds of work, *without injurious change*, except that common to all baths from accumulation of alcohol and ether. For a standard strength in the studio I should not exceed thirty grains to the ounce of water—first, Because *less injury results* to the plate if it remain in the solution a few minutes after it is sensitised; second, A longer time may elapse after the plate is placed in the plate-holder before it is developed without the appearance of the annoying matt stains, which are so common in the hot season, when forty or forty-five grains are employed. These experiments have proved to me that much greater latitude may be exercised with our bath formulæ than is generally supposed, and with equally good results. Iodising the bath I consider not only unnecessary but actually injurious, when the strength of the solution does not exceed forty grains to the ounce. Having tested this matter often within the past ten years I have abandoned the practice entirely. If let alone the bath will take care of itself in this respect from first to last, while nothing desirable is sacrificed; by so doing pinholes are thus banished effectually by removing the cause, viz., excess of iodide of silver. When ammonia salts predominate in the collodion it is better to reduce the proportion of iodide from five to three and a-half grains, and that of bromide from two to one and a-half grains, to the ounce of plain collodion, if the bath is thirty grains or less to the ounce. The practice now becoming general of dipping the plate in the bath film side down I strongly recommend; by so doing uniformly clean work may be made without the trouble of frequent filtration. I filter only after evaporation, and avoid frequent evaporation by leaving the cover of the bath open, so that the fumes of alcohol and ether may escape spontaneously. A cover for the bath should be made so that it will allow these fumes to escape and exclude the light and dust. Here is a chance for a little inventive genius. Having had occasion the past few years to try several processes for producing "large work" I have concluded that it is much better and easier made *direct* when the best appliances are at hand, and the required size does not exceed 20 × 24. For small children, or very restless subjects, box-light copies, &c., enlarging processes are indispensable, of course; still it will pay many establishments to provide themselves with the improved instruments for large direct work. Life-size busts may be made with an exposure of one and a-quarter to one and three-quarter minutes very satisfactorily as plain photographs; children three-quarter length, on 18 × 22 plates, with ten to twenty seconds' exposure, when circumstances are favourable. During the exposure of the plate I have often succeeded best by facing and engaging the sitter in conversation, or other means that judgment and experience suggest at the time. Instances are not uncommon when the best results are obtained by keeping the sitter unconscious of being in the "dentist's chair," and not informing him "*when the tooth is to be drawn.*" Let us not degrade ourselves or our profession by trying to talk off faulty work or by reducing prices, but bear in mind that good work will find patronage *in proportion to its merit.* Many people today can readily discriminate between the good and the bad, and he who adopts this principle will surely gain by it in the end. Let us not content ourselves to practise our art mechanically as artisans, but think, study, and earnestly strive to be artists in a proper sense, and see to it that we elevate our profession to a higher standard, if not, indeed, to fine art itself. I have an abiding faith in the capabilities of photography that it is destined to be the art (if *it be not already*) in the realm of portraiture at least. "Last, but not least," let us avail ourselves of the light the old masters have thrown upon the subject of art-culture. Many very valuable works may now be obtained upon this hitherto neglected subject.

The President: How would that be with the silver bath? Would there be a chance for evaporation?

Mr. Cross: I think there would be a great advantage in having a cover to allow the vapours to pass off and exclude all light whatever.

Q. What is the effect of the iodide or chloride of ammonium on the change?

A. The effect that I have found—I have neither in excess—is a thin film. There will be parts more opaque then others; they look as if thinly coated, showing transmitted light and opaque streaks.

Mr. Collins: Did you ever have little streaks, and when fixed with the cyanide they became opaque?

A. Yes, sir. That is one of the results of a too strong salting of the collodion or under-setting the film. These effects are very similar, being sometimes caused by iodising and the under-setting of the film, I find.

Mr. Collins: I made some collodion—five grains of potassium of iodide of ammonium to two of bromide—and could not get intensity. It was thin; no intensity to it. After it stood six months there was plenty of intensity.

A. Collodion must be of the right age. With cadmium that result may occur. With cadmium you cannot get it too old; in my experience that has been the case.

Q. What produces the transparent thread-line in the film running horizontally with the dip?

A. I should say stopping with the plate while immersing. The excessive alkali in the bath will do it.

Q. Is there any benefit to be derived from moving the plate in the bath?

A. Very great. I invariably do it.

## OPINIONS OF THE DAILY PRESS ON THE PHOTOGRAPHIC EXHIBITION.

The Photographic Society's Exhibition.—This exhibition commenced yesterday evening with a *conversazione* at the Rooms of the Society of Painters in Water Colours, at which most of the prominent photographers in London, with many from the provinces, were present. It is unnecessary to say that the exhibition is a good one. For years past one has expected to find here the best work of the season and the latest improvements in manipulation. Some very fine copies from pictures are shown; but, of course, the great body of exhibits may be divided into two classes—portraits and landscapes. Among the former many very beautiful works are shown. Mr. Hawke, of Plymouth, sends four really excellent cabinet portraits, which, for delicate shading and perfect management of tone, are unsurpassed by anything in the room. Mr. Valentine Blanchard sends an enlarged portrait of *Signor Salvini*, in which the expression of the great actor is very successfully retained. Messrs. Chaffin, of Yeovil; Messrs. W. and D. Downey, Mr. H. G. Cocking, and Mr. W. Bedford, all of London; Mr. J. M. Young, of Llandudno; and M. Theile, of Dresden, also contribute some charming photographs. But it is in landscapes that the exhibition is strongest. Here, first among the first, is Mr. Wilson, of Aberdeen, with landscapes which it is impossible too highly to praise. One, *A View of Balmoral*, with the heather-clad hills behind, is the gem of the exhibition; but although his work deserves such high praise, there are other artists who are his equal. A group of tree sketches by the Royal Engineers; *A Wayside Bridge in Surrey* and *A Surrey Lane*, by Messrs. A. and J. Bool; *A Group of Trees, Layton*, by Mr. W. Brooks; a series of views at and near Cyfarthfa, by Mr. R. T. Crawshay; *The Head of the Lake*, by Mr. B. B. Turner; *An Oak*, by Mr. E. Fox; and *Chiswick House*, by Mr. W. Bedford, are a few among the many admirable photographs, certainly almost perfect in their beauty, which attract attention in walking round the room. Mr. R. Faulkner, of Kensington Gardens Square, sends a number of admirable portraits of children; and Messrs. Marion and Co., Messrs. Spencer, Sawyer, Bird and Co., and the Woodbury Printing Company show what beautiful pictures may be made by enlargements from an ordinary negative. The exhibition is well worth a visit from all who are interested in photography, or who care to see what the most assiduous students of the art have been able to produce by dint of the most careful and painstaking study.—*Daily News.*

The Photographic Society's Exhibition.—Last night, in the Gallery of the Society of Painters in Water Colours, in Pall Mall East, the Photographic Society of Great Britain, which has for its president Mr. James Glaisher, held its annual exhibition. This year an experiment has been introduced in the hanging of the pictures, they now being distributed somewhat more in accordance with the subject and the style of picture, instead of all the subjects by one artist being hung together. The first picture taking the eye on entering the room is a life-size portrait of a lady, enlarged by the carbon process by the Woodbury Printing Company, who have numerous samples of the perfection to which this branch of the art of photography has been brought. Amongst the enlargements are also many by Messrs. Spencer, Sawyer, Bird and Co., by the autotype process. There are numerous portraits that will excite attention, prominent amongst which are those of *The Prince of Wales* in masonic costume (No. 36) by Marion and Co., and *Madame Patti* (No. 113) by J. E. Mayall. Photographs that will doubtless be viewed with much interest are those of the officers and crews of her Majesty's ships

*Alert* and *Discovery* (the Arctic vessels), as containing portraits of men whose names will become historical in connection with Arctic exploration. One of the most artistic and taking portraits in the exhibition is No. 17, by Hugo Thiele. There are also amongst the names of exhibitors those of Mr. Crawshay, Captain Horatio Ross, and other amateurs; but prominent above everything for careful execution and attention to minor detail are the landscapes by the Royal Engineers, who, under the able tuition of Captain Abney, have attained a rare excellence in this art. Two groups of heads of criminals taken from life will doubtless be a centre of attraction to those who care to study the facial characteristics of that class. Taking the exhibition as a whole there is the wherewithal to satisfy all classes, as it includes examples of every style and every process that the art of photography has yet developed. It may fairly be characterised as the most successful the Society has yet promoted.—*Standard.*

The Photographic Society.—This exhibition was opened yesterday for private view at the Gallery of the Society of Painters in Water Colours, Pall Mall East. The collection contains unmistakable proofs that the new art is advancing with rapid strides, and will soon be closer and closer allied to the artists and the author. The old blurriness and cloudiness and patchy black and white are disappearing, and an exquisite clearness of tint and tone is perceptible in most of the works, combined in many cases with a fine breadth of treatment. The carbon enlargements by the Woodbury Printing Company, *Monastic Ruins in Portugal* and *Views in Madrid*, &c., are remarkable for tone and breadth of form —such choice specimens of art that few brushes or pencils could equal them in fulness of detail, and no engraver could surpass the delightful studies of *Chiswick House*, by Mr. W. Bedford. There is a purity of atmosphere about these studies—particularly, indeed, in *The Gateway*—that paint cannot yet approach. Amongst the amateur photographic artists we rank the Vulcan of Wales, Mr. Crawshay, of Merthyr Tydvil, very high. His studies of the *River Usk*, the *Brecon Railway-bridge*, the *Waterfalls on Torpanton*, *Scethrog Lane*, and the *Cyfarthfa Limestone Quarry* are extraordinary for a mere amateur, and display the most delicate gradations of air and light, showing a skill and taste as unusual as it is delightful. In one or two the outline of the mountains is a trifle too dark and hard. For special interest we may mention the photographs of the two Arctic discovery vessels by Mr. H. Dixon, and finer, more intelligent, or more cheerful faces we never saw upon an English deck. Amongst these amateur works we may also mention with great praise the studies in Knowle Park by the Royal Engineers. The full foliage of summer is expressed with such power and life that we feel hot in the full sunshine that surrounds them and bathes them in rich content. *At the Pantomine* and *I Do Love You So* are capital photographs by the late Mr. Rejlander, and display his usual artistic feeling and broad, racy humour. As a specimen of breadth and microscopic detail, the *Hedge-sparrow's Nest*, by Mr. F. J. Palmer, is perfect; and, for higher qualities in art, Messrs. Bool's *Surrey Lane* and *Layard's-bridge* are noble examples of photographic art and artistic selection. The engravings copied by the Woodbury process for book illustrations cannot be distinguished from the originals, and Captain Turton's clever portraits on iron plates, the carbon enlargements by the Woodbury Printing Company, the examples of photographs burnt into china by Messrs. Copeland, and the enlargement by Kennett's pellicle process are all worthy of study by lovers of the art. The portraits are many of them lifelike; take, for instance, Mr. V. Blanchard's *Signor Salvini* and Mr. W. Leish's poetical head of a girl. Mrs. Cameron and Colonel Wortley are not, we believe, represented this year. Last night (Tuesday) the Society threw open its doors to its friends, and a very pleasant *soirée* was the result.—*Echo.*

The Photographic Society's Exhibition. — The finely-lighted Rooms of the Society of Painters in Water Colours, 5, Pall Mall East, is again used by the Photographic Society of Great Britain for their annual exhibition. Although some of the leading photographers whose works have been greatly admired in previous years are absent on the present occasion, still there is no lack of exhibitors, and the exhibition may, on the whole, fairly take rank with any that have preceded it. There has been no startling photographic discovery during the year—or, at least, there is no evidence of anything of the kind here—but in every part of the room there are gratifying proofs that the art has neither retrograded nor remained stationary. Positive progress may be traced in the excellence and perfection of most of the works. The different processes with which the scientific photographer has made us familiar have been further developed, and are now better understood than formerly, when, as new discoveries, they were rather experimental than definite and fixed. Take, for instance, the development of the process of autotype and of carbon enlargement, and it is hardly conceivable that such vast progress could have been made in such a comparatively brief interval of time. It may not be that any new chemical applications of moment have conduced greatly to this result. The confidence which the operator acquires by experience and his superior technical advantages do much to improve the finished outcome of his art. Blemishes of one kind and another are steadily but resolutely conquered, until, by degrees almost imperceptible, that *quasi* perfection, of which the present exhibition is the admirable exponent, is attained. Amongst the most noticeable specimens, both on account of their largeness and the completeness of their details, are those exhibited by the Woodbury Permanent Photographic Company. These are carbon enlargements from small negatives, and are most successful reproductions. Messrs. Spencer, Sawyer, Bird and Co. are equally *au fait* at the autotype enlargement process, and exhibit several charming examples. From the Royal Engineer School of Photography Chatham, there are many excellent specimens, marked by much tenderness in the gradations and free from insipidity or tameness. One of the first photographs in the collection is by Mr. B. B. Turner, Tulse-hill. It is entitled *The Head of the Lake*, a scene in Losely Park, and is a perfect a piece of woody landscape mirroring as could possibly be desired. The work is enlarged by the autotype process from a Talbotype paper negative, a copy of which was shown in the first exhibition of the Society, in 1854. Messrs. A. and J. Bool are also clever photographers of natural scenery, and their *Wayside Bridge*—a large work taken direct from nature, and not enlarged—has all the charm of a polychrome. Indeed, it is surprising how the almost countless gradations and tints which range between the highest light and the deepest shadow, when gathered up, as it were, by the magic of the photographer's lens and printed on paper, present to the eye so vivid a representation of the object or the scene before which the photographer places his instrument. Yet so it is, and from this fact the artist-painter may learn that colour, although indispensable in a work of realism or of high imaginativeness, is not *per se* necessary to a complete reproduction of an object of still life or a "bit" of nature. Nothing could be more satisfactory than some of the monochrome renderings of natural phenomena contributed to this exhibition. The studies of *Cloudland*, charming sky effects, by Messrs. B. Wyles and Co., of Southport, might doubtlessly be more intelligibly interpreted by the polychromatic touches of the artist's pencil, which would tone done the abrupt passages from black to white. Although the views—taken direct from nature, it is presumed—are highly creditable specimens of the art, they are less satisfactory as pictures than the more ordinary landscape effects. In the intensity of shadow-tints and the brilliance of the high lights the contrast is too violent. Form only is preserved; the eye is required to fill in the gorgeous tints of cadmium, madder, and vermilion; and it wants a skilful artist to distribute these aright. The larger part of the collection consists of landscape and outdoor studies; but there are some high-class examples of portraiture which call for a few words of notice. Those by Messrs. Cooper and Moorby, of Hull, three-quarter lengths, are very exquisite, and cannot fail to command attention. Messrs. Robinson and Thompson, of Liverpool, though working in a different way, produce equally happy results in their large, well-lit photos. of *Miss Rose Hersee* and *Carl Rosa*, in which the *chiaroscuro* is highly successful. For softness and effective distribution of light and shade there is nothing finer than the full-length portrait exhibited by M. Hugo Theile, of Dresden, and photographed from life by the wet collodion process. The mezzotint enlargements by Mr. G. Croughton, Lowestoft, are also good examples. There are some fine lifelike photos. in the Lambertype process—permanent, unretouched enlargements from cabinet—by M. Leon Lambert, Greenwich, which will repay close scrutiny. Mr. R. Faulkner, Kensington Gardens Square, contributes a frame of instantaneous photographs, chiefly of children in different attitudes and wearing vastly different expressions, together with some highly-finished and masterly enamel portraits, the softness and repose of which would have defied both the patience and the skill of the miniature painters of a century ago. Mr. Valentine Blanchard, *facile princeps* of photographers, is content to be represented by a single example, and that a telling one of *Salvini*, whose head fairly stands out in relief from the background, so judiciously is the lighting managed. The advice of Sir Joshua Reynolds to the students of the Academy was to take care of the shadows, and leave the lights to take care of themselves. Photography seems to have reversed that rule. Lights first; shadows are the necessary and natural corollary of them. By some sly process, however — perhaps by the mere cleverness which practice begets — Mr. Blanchard, while securing the lights and distributing them with well-balanced judgment, takes care that the shadows also shall not become their own nurses. The tenderest half-tones melt away as under the hand of a skilful artist, and the result is most flesh-like and natural. A less accomplished style of art is that exhibited in the two frames of heads—phrenological and physiognomical studies—by Mr. S. G. Payne, Aylesbury. These are taken from the inmates of a county gaol, and are interesting, but not inviting, specimens of humanity. Mr. H. Garratt Cocking, of Peckham, the "Stacey Marks" of photographers, sends two humorous subjects, of which preference is given to the *Knight of the Bath*, in which there is a *double entendre* that the boy's attitude clearly and cleverly enforces. *Sam Weller*, the companion picture, is not so successful. There are many other works that deserve notice, especially those by Mr. Crawshay, Cyfarthfa Castle; Messrs. W. and D. Downey, Pimlico; Messrs. Lombardi and Co., Pall Mall East; the late Mr. Rejlander; Captain Ross, Portsmouth; Mr. J. S. Stoddart, Margate, who contributes some vivid coast and sky effects; Mr. Sutcliffe, Tunbridge Wells; and, in fact, it is difficult to know upon whom not to bestow praise.—*Morning Advertiser.*

# Contemporary Press.

## PRODUCING COLOUR PHOTOGRAPHS.

[Scientific Review.]

The photography of colours, just as they appear in nature, is a problem despaired of by some as "too good to be true," and by others on the ground that every distinguishable tint and shade would require a different chemical in the preparation of the sensitised paper, and that such chemicals would inevitably cancel or interfere with one another. At all events, whatever be the reason, certain it is that anyone who talks seriously of photographing colours is regarded as a visionary.

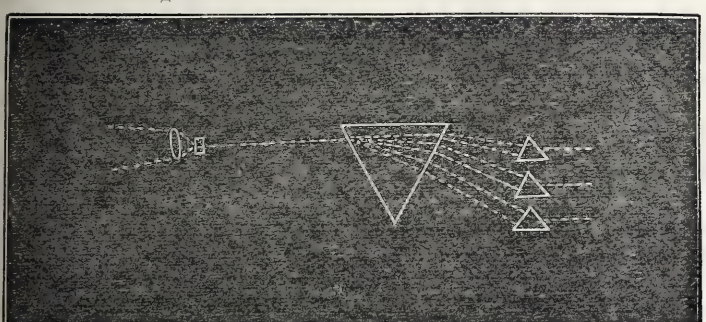
Nevertheless, I submit the following process as one which most will admit to be plausible, and which I, for my own part, feel convinced only requires development in order to render it as faithful a copyist of the colours as ordinary photography is of the lights and shades in the objects around us.

But before describing the nature of the invention I will explain how it is that I prefer, through your courtesy and with your permission, to give it to the public rather than to patent it and retain it in my own exclusive possession. In the first place, I think it is more likely to be speedily developed and brought to perfection when those interested in it and occupied upon it feel free and unfettered; and, secondly, such is the present state of the patent laws, with every prospect of becoming worse and worse, that I do not care to avail myself of the privilege thereby conferred upon me of ruining myself in self-defence against piracy and infringement.

This said, I will proceed with the invention; first, the description, and then the explanation.

The apparatus is simple, and it is placed between the object to be photographed and the lens.

It consists of four prisms, one large and three small, arranged as shown in the diagram.



The rays from the object will first traverse the large prism, after having been focalised and rendered parallel by two lenses. A spectrum is thus formed of which, of course, the blue rays are the most refrangible, and the red the least so.

The spectrum is then divided into three groups by the three small prisms. The red rays pass through the uppermost small prism, which being *similar* to the large one, only *inverted*, again makes the rays parallel and reproduces the image, but only the red parts thereof, and parts containing a mixture of red, such as orange, or pink, or purple, such medium tints being fainter or stronger according to the quantity of red contained. These rays are now expanded by lens to the required size, and a photograph is taken. The same is done with the blue rays, and the same with the yellow.

We have now three negatives, of which if prints be taken on ordinary prepared paper we have the same picture, except that in one all the reds and yellows appear as black and only the blues as white; in the second the yellows only appear as white, the blues and reds being black; and in the third the reds alone are white. It need hardly be said that the red plate would require exposure twenty times as long as the blue, and so on. At the same time, red rays, if exposed long enough, do produce the required chemical changes, and, as the blue rays would not interfere with such exposure, the effect might be obtained as strong as required; indeed, the reds might, if desired, be brought out so as to appear whiter than the blues. So far, however, we have no coloured photographs. It is well known that monochromes of any or nearly any required tint may be obtained by employing different chemical preparations. A sensitised paper is, therefore, taken upon which the action of light produces a red picture, and to the paper the negative obtained by the red rays is applied. This picture gives us, of course, all the reds just as they are in nature, except that where they are in nature mixed with blue or yellow here they are merely fainter shades of red.

After fixing, this paper is again treated like ordinary paper and re-sensitised, but this time so as to produce a yellow picture.

We have now all the reds, all the yellows, and all the intermediate shades of orange correctly shown in the picture. This is again fixed and again sensitised; this time so as to obtain a blue effect, and the glass obtained by the blue rays is applied, filling in all the remaining tints of nature.

The result is a coloured photograph as perfect as the purity of the ground colours used will permit.

Now, I have spoken, for simplicity's sake, of sensitising the paper as though for monochromes; but there is no doubt that the appropriate process for this purpose is the heliotype. Here we have a gelatinous deposit fixed and hardened when required, and dissolved and washed away when not wanted. This gelatine may, of course, be of any required colour, and any number of successive layers may be superimposed. Transparent colours being used the mixed shades would be as exact as possible and the effect charming.

It is hardly necessary to enter further into detail than just to remark that the original negatives obtained would first have to be reversed; that is, positives on glass must be taken from them and applied to the paper.

Coloured glasses might be employed instead of the system of prisms; but the effect therefrom is very unfaithful and imperfect, owing to the difficulty—nay, impossibility—of excluding all colours save one by means of coloured glass. If this idea meet with the approbation of any competent to judge I shall be glad to have their opinions.

Wordsworth Donisthorpe.

# Our Editorial Table.

## Studies from Nature. By Stephen Thompson.

London: Sampson Low and Co.

These "studies from nature," of which this is the first part, comprise four photographs from negatives by Mr. S. Thompson. The size of the pictures is about whole plate, subject to such trimming as may have been necessary in order to remove obtruding objects from the fore-grounds or sides. Each picture is accompanied by a page of descriptive letterpress.

Of the four photographs in this part *The Old Pier, Lynmouth*, will probably produce the greatest amount of satisfaction in those who who love scenes of maritime life; for here we see, high and dry on the beach (it being low water), a small vessel of the schooner *genus*, a narrow strip of water in the foreground, unpretending cottages in the middle distance, and as a background a steep, ascending slope thickly clad with foliage. "There is no more romantic spot on the beautiful North Devon Coast," writes the editor, "than Lynmouth! Ferny combes and leafy hollows, opening out upon the gleaming waters of the Western Sea succeed each other all around the coast; but at Lynmouth the entrancing beauty of the scene culminates." As a picture, however, we much prefer *The Monarch of the Woods*—a noble old oak tree. Of this subject Mr. Thompson writes:—"A great and noble tree is the English oak, and we love it well. The form of the oak is a perfect emblem of its qualities—so firm set, so massive and strong. You may always know it instantly—whether as a wintry skeleton form, bare and gnarled and angular, or in its summer garb of rich and finely-massed foliage; always the monarch of the wood."

These pictures, we observe, are printed by Messrs. A. and G. Taylor's permanent photo-mechanical process. The tone selected is brown, and altogether the style of the work is excellent.

# Correspondence.

## IMPRESSION FROM LABELS ON BACKS OF NEGATIVES.

*To the* Editors.

Gentlemen,—In a recent number of the Journal allusion was made to negatives receiving, during exposure, impressions from labels pasted on the back. This has occurred to me before, but never in so marked a manner as in the print I send you, from a "coffee and albumen" dry plate, where the words written in ink on the label can be clearly read both in negative and print.

I am puzzled to account for the fact that only this one of a batch of negatives, similarly prepared and labelled, shows the impression. The negative was fully exposed, and, from the fact of the label portion being *less dense* than the surrounding part, one might suppose the paper to have reflected excess of light into the film; but, if so, how is it that the film in front of the letters of the label is the most transparent of all? Can you explain it?—I am, yours, &c., Geo. S. Penny.

*Cheltenham, September* 24, 1875.

[We submit Mr. Penny's question for the consideration of our readers. It is one of great importance to all who use, but especially to all who manufacture, dry plates.—Eds.]

## ACCELERATED FILTRATION.

*To the* Editors.

Gentlemen,—In your *Foreign Notes and News* of the 17th inst. you have an article on the above subject.

The plan I adopt is exceedingly simple and economical. Instead of using an ordinary filter paper, I roll into a ball sufficient to fill the neck of a funnel in the inside, and pour in the solution. If it run through too quickly push the paper in with a glass rod; this regulates the flow.

In this way the solution goes through more quickly than by having the paper spread round the sides of the funnel, and the filtration will be quite as perfect.—I am, yours, &c., Edward Woodward.

*Macclesfield, September* 28, 1875.

## THE PHOTOGRAPHIC SOCIETY'S *CONVERSAZIONE.*

*To the* Editors.

Gentlemen,—This evening the exhibition of the Photographic Society of London opens with what is misnamed a "*conversazione*," and the President and Council request that all will appear in "evening dress."

I, for one, and I know that many others, will not attend, because I and they decline to descend to the donning of swallow-tailed coats for gentlemen and semi-indecent dresses for ladies, and ape the tomfooleries of those who consider themselves the upper classes.

I think I may safely state that every member of the Society, as well as his wife, possesses the good sense and taste to dress decently and becomingly, without being dictated to by the "President and Council" in attending what is nothing more than the *private view* of the Photographic Exhibition; and the President and Council should have trusted to that, and not have printed on the face of their cards of invitation what will be to many a prohibitory condition.

As it is, many members, and probably exhibitors, will certainly absent themselves from the *private view of their own exhibition* solely on account of the "evening dress" *fiasco;* and I beg to put on record my personal protest against the repetition of such a request being issued by the President and Council of the London Photographic Society.—I am, yours, &c., J. Werge.

11*a*, *Berners-street, September* 28, 1875.

[Although the adoption of "evening dress" was requested, it was understood that it would not be insisted on. It is usual at all *soirées* held in connection with scientific societies to adopt evening dress. This has certainly been our experience.—Eds.]

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

Rev. F. Hardwich.—Received. Thanks.

Registrations and Exchanges.—In our next.

J. S.—Any optician will procure the prism for you. The cost will vary from four to ten shillings, according to the size.

W.—By giving the negative a coating of albumen previous to applying the varnish the latter will not have any action on the film.

Pyrogallic.—By the adoption of opaque curtains the light is so shut out from the sitter as to leave only a small aperture at one side.

D. Scott.—We are unable to indicate the cause of the spots. While using that particular sample of paper it would be well to maks an alteration in the condition of the bath—by making it acid, for example, instead of alkaline.

Clericus.—You will certainly obtain parallel rays by using the plano-convex lens in the way proposed. The method to which we referred as having been employed by Professor Morton is similar to yours, only he uses three lenses instead of one. In this way he secures a larger amount of light than can be got otherwise. We await the arrival of the volume promised.

J. S. (Cheltenham), inquires:—"Can you inform your readers how it comes to pass that a certain Carbon Company, who profess to repudiate the use of silver, consume one hundred ounces per week?"——We reply:—Silver is used for other purposes in a photographic estaablishment than for printing. Negative baths, for instance, cannot be made without silver. We do not know, however, to what firm J. S. alludes.

Wilkie.—The reason why your negatives are too much like positives is that you give an exposnre which is not sufficient to produce detail. The chemicals—that is, the collodion and silver bath—may be imperfect, but this can easily be ascertained by trying another sample of collodion. If there be still too much clear glass you must alter the condition of the bath, and commence by making it neutral by means of carbonate of soda.

H. B. Berkeley.—Our correspondent writes:—"Do you think it would be *practicable* to take portraits with an electric-light apparatus connected with a twenty-cell Grove's battery, and furnished with condensers? When I say 'practicable' I mean that photos. should be obtained in a *reasonable time.* The electric apparatus would be a handy source of light, and, I think, cheap also, if the illumination, or rather the chemical rays, were sufficiently abundant to admit of moderately-quick action on the photographic plate."——Several years ago we went into the question of the comparative value and advantages of the electric and magnesium lights, and decided in favour of the latter on account of its cheapness and general convenience. Three strands of magnesium ribbon gave a light that was quite suited for obtaining a portrait by a moderatly-rapid exposure. A twenty-cell Grove's battery will scarcely answer the end proposed; we would recommend sixty cells in preference. The other matters referred to by our correspondent will receive attention next week.

T. Chilten.—This correspondent sends us a communication on his experience with the gelatino-bromide process, which is not satisfactory. A specimen which he has enclosed shows a puckered film-mark nearly an inch in length. At this place the gelatine has burst away from the plate, leaving the glass clear. There are also a great number of pinholes at one end of the plate. He asks if we, or some correspondent, can indicate a remedy for these evils. The plates have received careful usage. We publish his grievance in the hope of some one who has had experience giving a clue to the cause of such puckering.

Creeke and Co. (Manchestsr).—We are in receipt of a notice from these gentlemen, who are solicitors for Mr. A. Brothers, calling our attention to the libellous nature of advertisements recently inserted in the advertising sheet of this Journal by Mr. D. Winstanley. Without entering into the points in dispute between Mr. Winstanley and Mr. Brothers, we here publicly express an "opinion" of our own that our advertisement sheet is *not* a proper place to fight out a case which is occupying the attention of a legal tribunal. We decline to publish any more advertisements of such a personal character.

Charles Pearson, Junr., inquires:—"1. Which is the more suitable process for the production of lantern and stereo transparencies—the collodio-bromide or albumen?—2. In printing, should the prepared plate be placed in close contact with the negative; in which case is there no danger of damaging the sensitive film?"——We reply:—1. The albumen process of printing transparencies gives much finer results than those obtained by collodio-bromide. There is a rich, deep transparency in the shadows of an albumen transparency that cannot be obtained with collodion.—2. If the method of printing by superposition be adopted then the plate must be placed in close contact with the negative. It is much better to print by the camera.

Canny Scot.—The instructions and information concerning dry processes which our correspondent requires are to be found in the recent Almanacs issued in connection with this Journal. He is desirous of learning how to pose, and inquires—"Do you think a session or two at a school of art would help me to become a good poser, supposing I betook myself to the study of what is termed 'figure drawing?' I limit myself to figure drawing only because I do not see how ornamental, perspective, or mechanical would do me any good. Now figure drawing is generally the copying of examples of heads, arms, legs, &c., taken from famous pieces of sculpture and renowned paintings, the works of great masters. I can easily see that I might pick up a few ideas and hints as to what constituted true grace and beauty; but how to put it into daily practice is with me the rub. Supposing I should get a *Madonna Mary*, by Da Vinci, or a *Venus* or *Ajax*, or anything you like, by Praxiteles, to copy, how could that help me? The former would probably be clothed in robes flowing in beautifully-graceful lines, but having no likeness to the dress of the present age, while either of the latter would likely be void of any garments whatever. Some folks say figure drawing would do me good. On considering the foregoing do you think it would? or do you know of anything else that would enable me to reach my desideratum?"——What we have always recommended as the best method of learning how to pose is first of all to acquire a few of the leading principles which govern the posing of a figure, and then carefully study such pictures—whether they be paintings, engravings, drawings, or photographs—as one can obtain; and, fortunately for the art-aspirant, numerous excellent examples of artistic posing are now within the reach of every person, owing to the great number of illustrated serials which are a characteristic of the periodical literature of the day. A query is put with respect to an account of the various photographic lenses then in use which was publiehed in our Almanac for 1870. That volume is unfortunately out of print, but our correspondent will have no difficulty in procuring the loan of a copy. There is no other work in existence, so far as we are aware, in which an illustrated description of lenses, with the details of their peculiarities of construction and working, is to be found.

Received.—J. Brown; W. Cleary; "Winter;" E. W. F.; J. W. Gough; J. S.; A. Findlow, and others.—In our next.

## METEOROLOGICAL REPORT,

*For two Weeks ending September* 29, 1875.

Observations taken at 406, Strand, by J. H. Steward, Optician.

These Observations are Taken at 8.30 a.m.

| Sept. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 16 | 30·11 | E | 55 | 57 | 73 | 54 | Foggy |
| 17 | 30·09 | E | 60 | 62 | 77 | 56 | Raining |
| 18 | 30·07 | E | 59 | 60 | 81 | 58 | Misty |
| 20 | 30·00 | W | 57 | 60 | 72 | 57 | Misty |
| 21 | 29·93 | W | 58 | 60 | 67 | 57 | Dull |
| 22 | 29·65 | W | 63 | 63 | — | 59 | Dull |
| 23 | 30·11 | E | 54 | 56 | 60 | 55 | Dull |
| 24 | 30·15 | SE | 53 | 55 | 62 | 53 | Dull |
| 25 | 29·86 | SW | 61 | 62 | 69 | 54 | Raining |
| 27 | 29·70 | W | 51 | 55 | 66 | 52 | Cloudy |
| 28 | 29·77 | W | 55 | 58 | 63 | 54 | Dull |
| 29 | 29·85 | W | 49 | 51 | — | 48 | Cloudy |

CONTENTS.

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## DEFECTS IN THE COLLODIO-ALBUMEN PROCESS.

It is not our intention at present either to pronounce any eulogium on this tried and popular process, or to enter into any comparison between it and other dry processes of more recent introduction, but rather to indicate two directions in which shortcomings are occasionally apparent, and which lead in some instances, to a condemnation of the process and attributing to it defects which are not inherent in it in reality.

Some experimentalists have found that a slight veil covers those portions of the negative which should be bare glass, such as the very deepest part of a shadow; also, that the veiling is sometimes of such a pronounced character as to be entitled to the designation of fogging. This is the first of the two defects above hinted at to be encountered in working with collodio-albumen, and we shall now describe its cause and suggest the remedy.

An important feature in this process is the possibility of preparing the plates, up to the final stage, in broad daylight, and of this property photographers avail themselves to the utmost extent—one gentleman of our acquaintance, who is an excellent manipulator as well as artist, going so far in this direction as to prepare his plates at a bench fitted up in his garden. But, in order that the point of what follows may be more easily appreciated, we shall here indicate the various operations incident to the preparation of a collodio-albumen plate.

The plate is coated with iodised collodion of an old and porous description; it is excited in a nitrate of silver bath; is then washed very thoroughly, and receives an application of bromo-iodised albumen, which is allowed to dry. All these operations may be effected in daylight, for the collodion film merely acts the part of a substratum or cushion upon which the albumen film is supported, the albumen, of course, permeating the body of the collodion in addition to forming a layer upon its surface. In this stage the plates may be stowed away in any convenient store-box ready to receive the final sensitising, which is effected by a brief immersion in an aceto-nitrate of silver bath, followed by washing in water.

From this outline it will be seen that the plate receives a coating of iodised collodion. Owing to the fact that the iodide of silver does not play any chemical part in the subsequent formation of the image, it has been imagined, and with much justice, that almost any kind of collodion and nitrate bath will answer for forming this preliminary pellicle. Now, as iodide of silver, when present in the dried film of collodion, is not sensitive to light, it follows that the preparation of the plate may just as well, and with much more convenience, be carried on in a well-lighted garden as in a semi-dark laboratory, and no instance of failure has ever been recorded from this cause.

But in speaking of an *iodised* collodion we mean literally what we say, and not a *bromo*-iodised collodion. All commercial collodions now made contain a bromide in conjunction with the iodide, and as a consequence of this a small proportion of bromide of silver will be formed in the collodion film along with the iodide of silver. The latter substance, we have said, is not sensitive in the sense in which we now use the term, but the bromide of silver *is* so to a very considerable extent; consequently when light is allowed to fall upon the plate during any stage of its preparation, the bromide present in the collodion is immediately affected in a degree proportionate to the intensity of the light or the duration of its action—hence the fogging or veiling which is to be found in some of the collodio-albumen plates prepared with commercial bromo-iodised collodion.

The remedy is twofold:—First: use only a simply-iodised collodion in which there is no bromide. Second: if such a collodion be not accessible, and it be necessary to use a bromo-iodised sample, then let the plates be prepared in a place in which there is no strong light; and after preparation—up to the final sensitising—see that they are not exposed to strong light. By adopting either of these precautions the resulting negatives will be crisp and clean.

A second drawback sometimes experienced in connection with the collodio-albumen process is an occasional want of sensitiveness, which in some instances is so great as to prevent the possibility of a negative being taken unless by an exposure prolonged beyond reasonable measure. Mr. W. H. Price—who, in the course of conversation, directed our attention to this fault, having made it the subject of special investigation—found that it was owing to the treatment the plate received after the final sensitising in the aceto-nitrate bath.

In the eminently lucid directions given by Mr. Price to us concerning what was in his opinion the best way of preparing plates for the collodio-albumen process, and which we embodied in an article published in the Journal for May 27, 1870, it is recommended that the plates, after having been finally excited, be first washed with plain water, then placed for a brief period in a ten-grain bath of chloride of sodium, again washed, and, after being dipped in a three-grain solution of gallic acid, dried and stored away in the certainty that they will keep good for several years. But it has also been recommended that a bath of iodide of potassium may be advantageously substituted for that of chloride of sodium, the reason given —a very plausible one—being that by the action of the alkaline iodide the traces of nitrate of silver remaining in the film would be converted into iodide of silver, and thus aid in enriching the film.

After due investigation, Mr. Price has found that plates treated in this way are apt, after a short time, to become the subjects of a desensitising action that appears to go on—an inquiry into the nature of which would be impossible in the present article, but of its practical effects there can be no doubt. Having on one occasion departed from his usual practice as above recorded, and having substituted iodide of potassium for chloride of sodium in the preparation of a large number of plates intended to be used during a proposed tour on the continent, Mr. Price, previous to starting, determined to try the quality of his plates. This trial showed a lamentable lack of sensitiveness, and led to the investigation to which we have alluded. We may add, by way of sequel, that a fresh supply of plates were prepared, which differed in preparation from the others in no respect save in the substitution of a chloride for an iodide compound. Seventy-two of these

plates yielded seventy good negatives, two only having been lost, and those through the inadvertence of exposing one plate twice over, and not exposing its fellow at all, double backs being employed.

## THE LESSONS OF THE PHOTOGRAPHIC EXHIBITION.

### II.—The Heads and Fronts of Offenders.

Far from being the least interesting and valuable contribution to the pictorial display on the walls and screens of the Exhibition are two frames each containing about a hundred heads and busts of *carte* dimensions. These, we learn from an intimation upon the frames, have been taken in the open air, and are the portraits of criminals—veritable "gaol-birds"—photographed, presumably, in the gaol yard of Aylesbury. They are exhibited as physiognomical studies, and such they are, unmistakably.

One or two newspaper critics and a considerable number of the public who have visited the Exhibition, have made strong and decided remarks on the physiognomical and phrenological character of these two hundred gaol occupants as clearly indicated in their photographs, "which, of course, cannot lie." Handsome ladies have elevated their pretty noses when viewing such of their unfortunate sisters as are here depicted, have denounced them as "depraved creatures," and have turned away in proud consciousness of their own superlativeness. By the other sex have been freely bestowed upon *their* brethren thus held up as a spectacle the choicest phrases at their disposal—such as "rascals," "rogues," "scape-graces," "delinquents," "gaol-birds," "wretches," "reprobates," "blackguards," "hardened irreclaimables," and other terms of similar import.

We, too, have bestowed a short time on the close examination of these photographs, and have to differ to a great extent from some of the opinions so freely expressed in the uncomplimentary epithets we have cited. But of this more hereafter. Meanwhile, recognising certain shortcomings in the above portraits, we enter upon the question—What is the best method by which to take a portrait conveying a good idea of the natural character of an individual?

By physiognomy is meant, we presume, the deducing of the mental and moral character from the facial lineaments. This presupposes the fact—for a fact, we imagine, it must be held to be—that the inner character is generally indicated on the human countenance. Unpremeditated predilection or aversion is owing to the observer detecting in the face of the observed some trait of character in harmony or discordance with his or her own. Those feelings and passions which, when active, are accompanied by facial change, impart, when frequently indulged in, a permanent aspect to the countenance. Still, this cannot be taken to be a rule without exception; for, on the one hand, a person may, by strong mental effort, prevent his feelings or passions from becoming physiognomically expressed, thus being a great deal "worse than he looks;" or, on the other hand, a man of equable and good natural disposition may possess lineaments of an unpleasing type inherited from his forefathers; or, again, by imitation of others, he may acquire permanent lineaments of a character foreign to his natural disposition. But notwithstanding these exceptions, physiognomy, although not an exact science, is yet entitled to much consideration. After these general remarks we now revisit the frame of two hundred portraits from Aylesbury gaol exhibited as physiognomical studies.

The first thing which strikes one is the fact of many, indeed the majority, of them having a constrained, fretful, tart, unpleasant, nay painful, expression; while in others the expression is that of petulance and acerbity. Querulousness and vindictiveness might be said to be the characteristics of others; *but*—and we request attention to what here follows—we have seen, and we possess, numerous photographs of leading photographers, leading divines of all denominations, groups of members of temperance, masonic, and other unexceptionable societies, and picnic parties in which good nature ran rampant, all of them indicating as little amiability of feature as that displayed in the Aylesbury unfortunates.

And what is the cause? Simply this—that when portraits, or groups of persons, are photographed in the open air (as these criminals were) it is very difficult for many to endure for any lengthened period a strong light upon the face. A painful, and in some instances a villainous, cast of expression may momentarily appear in the eyes under such circumstances, and the portrait thus taken will not prove a trustworthy exponent of the true character of the person so photographed. Even in the Photographic Society we have seen this unpleasant, sullen, wobegone, even hang-dog, appearance portrayed on the countenances of some of the best men in existence, through the simple incident of a lime light having been suddenly projected on to their faces after they had been sitting for a short time in comparative darkness. The value, therefore, as physiognomical studies, of pictures obtained under the circumstances in which these criminals were taken is very much less than would have been the case if obtained under circumstances more comfortable for the subjects. Besides, it is scarcely to be expected that any save that of a dogged and defiant expression can be assumed by a criminal seated in front of a camera which he is aware must aid in rendering him notorious in the archives of the gaols and police-offices of the whole country.

But, again: photographs of the class here spoken of possess, or should possess, much value from a phrenological as well as a physiognomical point of view. Without expressing any opinion concerning the truth of phrenology as a science, we presume that few will dispute that in the outward configuration of the skull is to be found, at least to some extent, an index of the faculties of the mind. Probably nine-tenths of our readers believe that the intellectual or perceptive faculties are represented by the anterior portion of the brain, the sentiments and emotions by the middle and upper, and the animal propensities by the posterior and lower portions.

To apply the foregoing to the case before us: that several heads among the Aylesbury delinquents are largely developed in the intellectual region is not open to any doubt; but the *cartes* of these criminals are each a direct, full-face portrait, and thus cannot afford information to the student concerning the general balance of the various organs, there being little to indicate the fact whether the individual has a projecting or a retreating forehead. A binocular portrait might do much to aid in discovering this; but the simple, obvious, and most efficient remedy is to take the portrait in profile. In this way only can the general relation existing between the intellectual, animal, and other faculties be ascertained.

It may be objected that this would entail a twofold operation and a double amount of trouble upon the operator. We reply that by the expedient of placing a small mirror at one side of the head of the sitter and at an angle of forty-five degrees to the direction of the camera lens, two views of the sitter—a front or full face and a profile—may be simultaneously taken on one negative.

## WINTER EMPLOYMENT FOR AMATEURS.

As the year moves on and the season for outdoor work closes cameras are packed away for the winter, and amateurs begin to cast about for means of employment during the dark evenings. There is, fortunately, no necessity to remain idle or to relinquish photographic pursuits entirely, even though the weather and light combine to render outdoor work almost impracticable; and most amateurs will be found to have some hobby or favourite amusement which enables them to keep themselves in practice during those months when many channels of employment are closed to them. The enlarging camera, the microscope, and the lantern are all in more or less favour, but probably the most popular as well as one of the most pleasing occupations is the production of transparencies either for the stereoscope, the lantern, or decorative purposes.

This popularity is traceable most certainly to the facility with which the finest results can be produced without the necessity of any special apparatus or chemicals of an expensive description; but yet the production of this class of picture has not been developed to the extent it deserves. This may be owing to the comparatively small amount of care bestowed upon transparencies in contradistinction to negatives, which thus results in the production of very inferior work;

and, though a fine transparency is infinitely superior as regards beauty and artistic effect to a similar print upon paper, glass pictures of a lower class fail to give satisfaction or to encourage perseverance in that branch of the art.

Now, however, it is possible to obtain commercially either dry plates or emulsion of such a quality as to remove all excuse for failure or slovenly work; and it is with the object of calling attention to this somewhat neglected subject, and of pointing out the best methods of working, that we write this article. We shall speak of the respective advantages of the different mechanical, as well as chemical, details, so as to afford the merest tyro an opportunity of selecting the process which appears the most likely to suit his own requirements.

In the first place, we have the choice between wet and dry plates—between albumen, gelatine, and collodion—as the vehicle for carrying the image, and the list may be extended by the addition of carbon printing. Then, again, there is the method of printing by superposition upon a dry plate or, by means of the camera, on a wet one; while the number of variations which it is possible to make with a view of affecting the colour or fineness of the deposit are almost innumerable. We will commence with the most generally-adopted plan, viz., by superposition, by which means it is possible to obtain the very best results with the minimum of trouble.

As regards the process to be employed, that point may be left very much to the option of individual readers; though, undoubtedly, the finest results are produced upon albumen films. We ourselves are partial to emulsion plates (on account of the greater simplicity of manipulation)—not the rapid ones made for negative purposes, but, rather, a slow, specially-made emulsion with considerable excess of soluble bromide. This enables us to produce a clean, vigorous image of great delicacy, giving, in addition, a film of great fineness. The more rapid plates are liable to give flat results unless exposed very correctly, and scarcely anything we know has a worse effect than one of these over-exposed and, probably, under-developed pictures without the slightest contrast. We have seen some very fine transparencies produced, however, on tolerably rapid gelatine plates, and which were quite free from any such defect; but the plates received special treatment previous to development in order to obviate the fault complained of in such cases. If the extra trouble requisite on preparing the gelatine plates be not an objection, very beautiful results are obtainable by their means; but, as with collodion, it is preferable to work with free bromide.

As we have previously remarked, we are partial to emulsion plates, and shall at present confine ourselves to the description of the preparation of such plates with collodion or gelatine as the basis. To give a description of the manufacture of a collodion emulsion may appear somewhat supererogatory; and, indeed, the *old* collodio-bromide process will work as well as any. But in these days of rapid emulsions there are many who perhaps, without a formula, would scarcely know how to prepare plates of the description we wish to recommend.

Of course for those who already possess a stock of bromised collodion it is unnecessary to make a special one; the only point to be observed is to use so much less silver for sensitising as to leave an excess of from one to two grains per ounce of soluble bromide. But the formula we recommend to those who are not in possession of the necessary bromised collodion stands as follows:—

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| Ether (about ·730) | 2 | ounces. |
| Alcohol (absolute) | 1½ | ounce. |
| Pyroxyline (of good quality, and suitable for emulsions) | 24 | grains. |
| Bromide of cadmium (dried) | 24 | „ |
| „ ammonium | 12 | „ |

Triturate the bromides *together*, in a mortar, with the alcohol, and add gradually the ether. It frequently happens that the addition of the whole of the ether at once will bring about the precipitation of a portion of the bromide, which is then difficult to redissolve. When the solution is perfect the pyroxyline is to be added, having been previously pulled out into light tufts, and the mixture well shaken for a few moments. It may then be allowed to stand until clear or may be filtered at once—the former plan, however, being preferable.

This collodion may be used at once, but it gives better results if kept for a few days, or a week, before sensitising. To make the emulsion: for each seven drachms of the above collodion take ten grains of nitrate of silver and dissolve it in a test tube by means of heat, in the smallest possible quantity of water. The quantity of water necessary will not be more than five *minims*, as silver nitrate is soluble in about half its weight of boiling water—rather less, if anything. In another test tube, for each ten grains of silver place one drachm of absolute alcohol, and raise it to the point of ebullition either over the flame of a lamp or by plunging the tube into hot water. The alcohol is then added gradually to the solution of silver, and the whole reheated to ensure complete solution, when it is poured, in small quantities at a time, into the collodion, shaking between each addition. The emulsion so formed must be kept for at least twenty-four hours before use, and improves even after that. It will keep good for a considerable period.

If it be desired to prepare the plates without the trouble of washing the emulsion may be poured out, washed, and dried in the manner lately so much in vogue. In case Mr. M. Carey Lea's principle of organifying the mass of emulsion before drying be deemed the better plan it may be adopted; but in such a case we recommend washing the partially-dried pellicle free from all trace of soluble bromide *previous to the application of the organifier*. This not only prevents the preservative solution from becoming loaded with bromides (which would cause in time very great want of rapidity), but it allows the full action of the organic matter upon the sensitive compound without necessitating its total removal by prolonged washing after its application. A slight rinse in one or, at most, two changes of water will then be sufficient, and that will leave traces of the preservative matter in the body of the pellicle to act mechanically in rendering the finished film more porous.

Instead of this mode of action the pellicle may be simply washed free of bromide, and the effect of the organic matter secured by the addition of a suitable substance to the finished emulsion. We have a very great choice of materials capable of producing useful results, amongst which, for application previous to desiccation, we may mention the following, giving them in the order we prefer them:—Albumen and coffee, plain coffee, tannin, and infusion of malt. Amongst the substances which may be added to the emulsion after re-solution we place in the order of their value:—Tannin, sulphate of quinine (or the base itself), tannin and gallic acid combined, or nitro-glucose. Upon the choice of the organic substance employed depends almost entirely the tone of the developed picture—coffee, tannin, and gallic acid giving brown tones of various shades; albumen conferring a greenish-olive tinge; whilst quinine and nitro-glucose tend to the production of a neutral black. These colours are, however, of course, modified to a great extent by the exposure.

In addition to the effect exercised upon the colour of the image, tannin and quinine also possess a very marked retarding power upon the development—so much so that films containing these substances in any quantity will develope perfectly clear without any addition of bromide, even when the action has to be pushed in order to produce detail. In the case of quinine bromide in the developer is not only unnecessary but, if anything, injurious, as it renders the development so extremely tedious.

To turn from collodio-bromide: those who at the expense of a little extra trouble in the preparation of the plates wish to secure almost the finest results obtainable may do so by resorting to the gelatine emulsion. Though several complaints have been made during the present or past season with regard to gelatine we believe but little difficulty will be found in working it during the winter months. The special formula we recommend for transparencies, and which, last winter, produced almost perfect results in our hands, is the following:—

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| Gelatine | 100 | grains. |
| Water | 5 | ounces. |
| Bromide of potassium | 60 | grains. |
| Nitrate of silver | 80 | „ |

Place the gelatine to soak for several hours, and when thoroughly swelled pour off the non-absorbed water and drain; then add the silver dissolved in one ounce of water, and place the bottle containing them in a jar of hot water. When the gelatine is dissolved make a solution of the bromide in another ounce of *hot* water and add it to the silvered gelatine, stirring or shaking well. But little change will take place in consequence of the thickness of the gelatine mixture. The alcohol is now added, and, when thoroughly mixed, make up the emulsion to five ounces by the addition of hot water. The silver bromide now begins to form slowly, and if the mixture be kept liquid, by allowing it to stand in warm water, the action will be complete in a few hours.

We prefer, however, to let it have at least thirty-six hours in order to produce the full effect, when it is poured out to the depth of about a quarter of an inch and allowed to "set." As soon as firm it is cut up into strips with an ivory paper-knife and placed to soak in cold distilled water for an hour. Four or five, or even more, changes of ordinary water are then given, the whole soaking extending over about six hours. Pour away the last water and drain well, then transfer the gelatinous mass to a wide-mouthed bottle, and apply heat in order to liquefy it; the bulk is then made up to five or six ounces according to the density of film required, adding methylated alcohol in the proportion of from one to two drachms in each ounce.

This emulsion must be used within a week or so of its preparation, as it decomposes rapidly, even in winter. Antiseptics appear to be powerless to prevent the permanent liquefaction of the gelatine; but as several dozen plates may be coated in the course of a single evening little difficulty need be experienced in working off the above quantity of emulsion.

We have already occupied so much space that we shall be compelled to postpone until next week our description of the various methods of subsequent treatment. We then propose to describe the various mechanical means necessary, as well as the best methods of preparation and development of the plates.

## THE PHOTOGRAPHIC EXHIBITION.

[Second Notice.]

The "lay" press has endorsed the opinion expressed in our former article, and, so far as it has spoken, has pronounced the present Exhibition to be the best yet held under the auspices of the Photographic Society. Other critical notices have appeared in journals connected with the outside press, in addition to those we published last week, one of which, that of *The Times*, will be found in the present number.

In *The Nest* (No. 1.), by Messrs. B. Wyles and Co., we have a somewhat ambitious picture representing a bird's nest. The unusually low tone of the whites detracts from the effect, imparting a sombre appearance to the work. In *A Portrait* (28), by the same artists, we have a gentleman habited in the guise of an artist of the "olden time," with broad-brimmed hat, the inevitable velvet coat usually affected by artists, and a lace shirt collar which, for breadth—literal, not artistic—far exceeds that of the model man-of-war's-man. On a smaller scale this portrait would have been more pleasing. *Cloudland* (43 and 44) is the quaint designation given by the same artists to two frames of excellent photographs of clouds, in some of which we have pictures—we might say *portraits*—of the Sun himself. In these views of the sun we see, well marked, the effect of halation. A small disc of white indicates the orb of day; surrounding this is a larger circle much lower in tone, and from the outer edge of this dart out the beams so characteristic of Phœbus. What would be the effect, as respects this kind of halation, of taking such direct solar pictures on a very dark or black glass plate, and then removing the film from it to ordinary glass? This would ensure the absence of reflection from the back of the glass. We are for the moment assuming that ordinary precautions—such as painting the back of the glass—fail when a subject of such intense luminousness as the sun is being photographed.

Among the enlargements in the Exhibition two works in carbon—portraits respectively of H.R.H. the Prince of Wales and Sir Bartle Frere—by Messrs. Marion and Co., are specially deserving of commendation for their excellence.

There is one feature in this Exhibition to which we must take exception, namely, the presence of a large number of portraits, and also landscapes, by Messrs. Spencer, Sawyer, Bird, and Co., the Woodburytype Company, as well as by others, which have no distinctive appellation save that of "An Enlargement," "A Portrait," "An Imperial Portrait," "Autotype Enlargement," and soforth. Why cannot the subject of a landscape be given either in the margin of a print or in the catalogue, or, preferably, in both? It may, no doubt, be interesting to a few to be informed that a very large picture is an *enlargement;* but photographers know this without any special intimation of the fact, and those who are not photographers, as well as those who are, would like to be informed whether a certain charming landscape (8) is in the vicinity of London or of Melbourne, whether a a frame entitled *Portraits of Eminent Men* (19) represent men eminent in theology, astronomy, chemistry, physic, photography, or the civic council, and whether their eminence has been acquired in the old or new hemispheres. Why should not exhibitors name the portraits, instead of exhibiting them under such vague generalistic titles? The Council of the Society and exhibitors will consult their own interests in future by rendering the Exhibition more attractive and informing *in this respect* than it can possibly be at present.

As one of the most recent methods of producing and finishing enlargements the specimens exhibited by M. Lambert necessarily receive much attention from photographic visitors. Having already expressed our own opinion with regard to the nature and value of the Lambertype process, and the quality of the work M. Lambert produces by its agency, we here need only further say that visitors to the Exhibition have now an excellent opportunity of comparing this with other processes of enlargement and finishing, inasmuch as they are all displayed side by side.

We alluded last week to the portraits exhibited by Mr. John Hawke, of Plymouth. This artist contributes several fine works of that class, several of them being of the "*boudoir*" style of picture. Among the works of Mr. Hawke are some difficult subjects—ladies with white dresses. Difficulties of this kind have been most successfully overcome, dresses and faces being alike charmingly rendered. Nos. 328 and 338 are good examples of the same artist's work, the latter of these pictures representing a handsome girl leaning pensively over the end of a couch, indulging apparently in profound meditation—probably on the selection of one from a throng of suitors, or, equally probable, on the choice of a new bonnet.

The Woodbury Company exhibit very largely, and their exhibits embrace many pictures of extensive proportions. The largest portrait—a carbon enlargement—in the room (14) is by this firm. It is a portrait of a lady, is about four feet in length, is very skilfully worked up, and is placed in the centre of the upper end of the hall. The work possesses much merit. There are several other enlargements by the same artists, some of them quite equal in quality to that referred to, but not of such ample dimensions. We allude to their enlarged *portraits;* to their landscapes we shall refer in a separate notice.

The Autotype Company—as the firm composed of Messrs. Spencer, Sawyer, Bird and Co. are persistently designated by photographers—have this year given more prominence to landscapes than to portraiture. *Apropos* of autotype, the first thing that strikes a thoughtful visitor to the Exhibition, and which shows sufficiently clear into what groove photography is gliding, is the immense increase in the number of pictures printed in carbon. The catalogue includes a list of four hundred and ten contributions, and of these no fewer than one hundred and three are in carbon, or upwards of one-fourth—not including nine or ten respecting which we have some doubt, the pressure of other engagements not having yet permitted us to make a sufficiently close examination to ascertain whether they are carbon or silver. The difficulty of determining this without keen introspection also shows the great improvement made in the carbon process, or, rather, in the materials employed, rendering the texture and quality of the prints produced so much finer, and so nearly approaching the delicacy of the older mode of production. When

the size of the carbon pictures is taken into consideration the impression made upon us is still stronger, as the *area* of prints by the new process must be considerably more than one-half—we should say nearly three-fourths—of the space occupied by prints produced by the carbon process.

But we must defer a notice of the works exhibited by this eminent "Carbon Company" till next week.

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In our *Foreign Notes and News* this week we have mentioned the results of Herr R. Weber's experiments in connection with the action of light upon the germination of seeds. Though it is scarcely a subject which can be called *photographic*, still we think that anything bearing upon the action of light must be of interest at least to scientific photographers. We have no doubt that very many of our readers take an interest in horticultural pursuits, and to such it must be interesting to trace the connection between the action of light upon vegetation and upon the photographic film. The researches of Herr Weber are but a repetition of those of Hunt, published many years ago, but fail in treating the subject so exhaustively as did the latter gentleman. In the first place Herr Weber finds that germination takes place soonest under the "darkest glasses." Now Hunt's observations tend to prove that *light* is a retarder, while *actinism* is an accelerator, of germination. By using screens of—first, blue glass; second, a trough containing solution of sulphate of copper; and third, a trough holding solution of ammoniate of copper, very different results were obtained. Each of the above media obstruct light, heat, and actinic rays in different proportions—the quantity of actinism obstructed *decreasing* in the order we have named the media above, while, at the same time, the quantity of light and heat rays *increases* in proportion. The result of experiments with various seeds was that in those portions which were covered with any of the screens we speak of germination took place much more rapidly than in the portion kept in total darkness. It is well known that scientific horticulturists preserve the seed for a day or two in total darkness after sowing in order to hasten as well as strengthen germination. The effect reported above, therefore, tends to show that light deprived of all but the actinic rays has an accelerating effect upon germination. This is further corroborated by the action of the different media. It was found in each case that germination took place more rapidly under the solution of sulphate of copper than under the glass, and more rapidly again under the ammoniate of copper than under the sulphate. Furthermore: by increasing the density of the ammoniate solution until scarcely any light or heat rays could pass the accelerating influence still increased. In fact, Hunt sums up his researches in these words:—"After a great number of experiments it became evident that as the relative quantity of the luminous principle was increased so was the influence of the chemical radiations diminished." Previous to Hunt's researches Sennebier and Ingenhous had both shown that light retarded germination, the former, so far back as the latter part of last century, having stated that "light retards germination, and it is to prevent this that it is necessary to cover the seeds with soil." Ingenhous also, in *Experiences sur la Vegetation*, shows that germination takes place more rapidly in the dark than in daylight. A further proof of the correctness of these statements lies in the experiment quoted by Hunt, in which various seeds were allowed to germinate, one half in darkness, the other half shaded by a trough containing solution of bichromate of potash. The result in this case was that the portion exposed under the bichromate solution, which removed the whole of the actinic rays, germinated very much more slowly than the portion kept in darkness, thus pointing distinctly to the retarding power of the light rays. It is easily inferred from this that in the action of light upon germination there are two conflicting powers—light and actinism—and that the former is the more powerful; that it is for the purpose of avoiding the retarding action of light that the germination of seeds is usually commenced in darkness. The action of light upon germination must not be confounded, however, with its subsequent effect upon the growing plant.

## ON THE UTILISATION OF EXPERIENCE.

Happy are those photographers whose lines are cast in places where day and night are always nearly equal, and where all the year round brilliant sunshine is the rule and not the exception. Something of this kind I have frequently heard uttered, but only by those who have never had an opportunity of experiencing the dull monotony of the state of matters for which they longed. Not so say I, as I consider there is a charm in the ever-changing seasons and climatic conditions of our own country the loss of which cannot be compensated for by any advantage possessed by other countries. No doubt the professional photographer may occasionally wish that he could somewhat lengthen the days and improve the light from November to February; but, so far as the amateur is concerned, I think if he had the power so to alter the fixed condition of things he would generally be wise enough to leave it alone. Great as undoubtedly is the charm of landscape photography it is one that would lose much of its force if its practice were continuous, or, perhaps, I should rather say that much of the charm consists in the fact that it can only be pleasantly and successfully practised during a portion of the year, and even then is liable to considerable fluctuation. The pleasures of photography are not confined to the field, but really last all through the year, each season bringing opportunity for the enjoyment of something appropriate to it in connection with the art.

At the present time the season for outdoor work is drawing rapidly to a close, and, simultaneously, the time for the meetings of the various photographic societies is approaching. Between the two there is a very intimate connection, and much of the success of each depends in a large measure on the other. Keeping this fact in mind, I think it may not be altogether without profit to devote a few moments to the consideration of how best to make the two work together for their mutual benefit.

That this has hitherto been done to a large extent is recognised by all connected with photographic societies; but I think it is equally well known or believed that there is still much room for improvement. Anyone who will take the trouble to look over the reports of the meetings of the various societies during the past few years cannot fail to notice the fact that the papers read are contributed by comparatively few members; and, although they no doubt supply much useful information, both from their own experience and also from the experience of their more modest fellow-members, the taking of a more active interest in the actual work of the societies by a much greater number of the members generally is most desirable. That all the members should read lengthy papers is neither possible nor desirable, but that any person having spent a few days during the summer in the practice of either wet or dry collodion has not something to communicate that would be both interesting and useful I cannot believe. It should be always kept in mind that the sum of our photographic knowledge has been largely built up of little matters; and, as its extension must be mainly dependent on such contributions, each should throw in his mite, no matter how small may seem to him to be the importance of his suggestions.

In some societies it has become the practice—but not by any means so general as it should be—of the members to bring for exhibition specimens of *all* the work done during the season. This, if properly managed, cannot fail to be instructive; but the exhibition should include both prints and negatives, and sufficient time must be afforded to give full details as to process, exposure, development, &c. Nor should the specimens be confined to pictures that have been successful; in fact, a more practical lesson is frequently learned from a thorough failure than from a dozen successful efforts. In short, what I would counsel is that every member who has had an opportunity of spending some time in the field should be encouraged to give a full description of his operations, and to enter more or less minutely into the circumstances under which each picture was produced, dwelling especially on whatever failures he may have encountered and on the various remedies that were tried.

If such a system were generally adopted the secretaries of the various societies would have much less difficulty than they have at present in their arrangements for interesting business to be brought before the meetings, and the members, as a rule, would derive much more benefit from their attendance, while altogether the interest of the meetings would be more effectually maintained.

As a practical example of the value of a very slight hint to even a most experienced landscape photographer, I have just seen a box containing three dozen 12 × 10 negatives, only nine of which were fit for printing, the rest being hopelessly destroyed by large "oyster-shell" markings. Their history, as narrated by my friend, was instructive. He does not believe in dry collodion in any form; and, as he likes plenty of room to work the wet process, he started with a

Smartt's tent and three dozen cleaned and albumenised plates, intending to spend a week "doing" the lakes. The weather was intensely hot, but as the tent was well ventilated he did not expect difficulties on that score; and, as he knew his chemicals were in excellent order, he was sanguine of being successful. Success he could not command, however much he might deserve it; and his first negative was covered for at least a third from the bottom with the well-known white, silvery deposit. The slide was sponged out, and fresh blotting-paper used, both on the back and round the edges, but still the foe appeared, and refused to be exorcised by alcohol, acetic acid, or any other remedy with which he was acquainted; hence the work was for that day abandoned in despair. A second and third day passed with no better result, and he was standing in front of the tent examining his twenty-seventh failure, wishing that he were acquainted with an unknown tongue in which he might "harmlessly swear to his heart's content," when he was accosted by a stranger who introduced himself as a brother in the "black art," and into whose sympathising ear he quickly poured a detailed statement of his troubles. "Oh!" replied the stranger, "I know all about it; you don't drain long enough." "That cannot be," said my friend, "as I have kept the plates over the bath for more than five minutes, and the longer they are drained the worse they seem to get." "Just so," said his adviser, "but give them fifteen minutes, and then you may walk with the slide for a mile, and when you come back the plate will develope as clean as a new cent piece. Try it, and when you succeed, don't go on saying that you have nothing to learn from your brethren from across the water." The "dodge" was tried, and nine perfect negatives give abundant evidence of the soundness of the advice. My friend added that he had since experimented somewhat extensively in the same direction, and found that when the plate was only partially drained the markings invariably made their appearance, but that when sufficient time had been allowed to let it become apparently surface dry it developed all right.

Now I have no doubt that there is hardly a photographer who has been out during the past season who has not some similar story to tell; and I am certain that if the method I have suggested of bringing them before the meetings of the various societies were fully adopted the general stock of knowledge would be largely increased, and the interest in the societies' proceedings much promoted.

John Nicol, Ph.D.

## FOREIGN NOTES AND NEWS.

A New Precipitant for the Silver in Hypo. Residues.—A Substitute for the Albumen Substratum.—The Influence of Different Coloured Lights Upon Plants.—Exhibition Notes: An Omission from the Notes on the Vienna Exhibition.—The Extent of the Brussels Exhibition.—The Proposed Photographic Hall at the Philadelphia Exhibition.—The Forthcoming Exhibition at Calcutta.—The Polystéréorama.—Rendering Paper Translucent.—Water in Collodion.—A New Formula for Salted Paper.—Preserving Sensitive Paper.

Photographers who reduce their own silver residues will be pleased to hear that, as the result of a long series of experiments, Dr. Vogel, of Berlin, has hit upon a new plan for precipitating the silver contained in the refuse solution of the hyposulphite of soda fixing bath. Those who have not hitherto reduced this solution themselves—either on account of the impurity of the deposit and the offensiveness of the sulphurous fumes given off when liver of sulphur (sulphide of potassium) is the precipitant, or the slowness with which the desired result is obtained when iron, zinc, or copper filings are employed—may alter their practice when the new agent, which is stated to be free from all these drawbacks, is introduced. This new agent is said to be capable of precipitating the silver contained in an ordinary fixing bath in an almost pure metallic condition, in less than an hour, at a cost of about a shilling per pound. Further particulars are promised.

It is self-evident that it is of the utmost importance to the dry-plate worker that he should obtain a collodion film which adheres perfectly to the glass, so as not to tear when placed under the water tap. To ensure this firm adhesion a preliminary coating of albumen or gutta-percha is now generally used, and from time to time various other substances are recommended as substitutes for these. Herr Harnecker, of Wrietzen, in a communication upon this subject to the *Mittheilungen*, says that, instead of a preliminary coating, he adds four drops of castor oil to one pound of collodion to produce adhesion.

Herr R. Weber has made some curious observations on the effect of various coloured lights upon growing plants. He planted some peas and allowed them to germinate and grow under different coloured glasses. Germination, he found, took place soonest under the darkest glasses, and the amount of mineral substances the plants contained depended upon the colour of the light. Calcium was most freely absorbed under the influence of the very refrangible rays of the blue and violet glasses; phosphorus, on the contrary, under cover of yellow and red glasses.

Owing to most of the photographic societies being in recess, there is little foreign news this "silly season" except about exhibitions. In the notes on the Vienna Exhibition we omitted to mention that the only silver medal awarded for anything in the shape of portraiture was obtained by Mr. H. P. Robinson (Robinson and Cherrill), Tunbridge Wells, for combination pictures.

Herr Philip Remelé, whose photographs in the Lybian Desert we had occasion to note some months ago, has been awarded an honourable mention at the recent Geographical Exhibition at Paris.

The following analysis of the nationality and extent of the photographic exhibition at Brussels has just come to hand, and contains some particulars not mentioned in the former notices of that exhibition:—

The total number of exhibitors was eighty-five, and the countries represented were—*Belgium:* twenty-eight exhibitors, of whom twelve showed carbon prints, four lichtdrucks, five apparatus, and the remainder silver prints.—*Germany:* thirteen exhibitors, two showing carbon prints, two lichtdrucks, two enamels, and seven silver prints.—*France:* twelve exhibitors, three showing apparatus, four silver prints, three lichtdrucks, Woodburytypes, and phototypes.—*Great Britain:* nine exhibitors, two showing carbon prints, two lichtdrucks, one enamels, one apparatus, one negatives of the transit of Venus, and the others silver prints.—*America:* four exhibitors, two showing apparatus and two silver prints.—Russia, Poland, Denmark, Spain, Portugal, and Italy had each one representative who exhibited silver prints.

As our readers are already aware, the Commissioners of the Philadelphia International Exhibition at first intended to set apart a portion of the Art Hall for photographs; but, owing to the overwhelming number of painters and sculptors who have applied for room, this was found to be impracticable, and it was decided that the photographs must go to the principal building and be placed amongst the industrial products. There they would be completely swamped by the multitude of other exhibits, as they would no longer form a complete and compact exhibition of themselves, but would be scattered all over the building, the works of each photographer being placed in the section allotted to his nation. This decision was disappointing to American photographers generally, and the National Photographic Association took the matter up and set on foot a subscription for the purpose of erecting a special building for photographs and photographic appliances. A plan has been prepared for a handsome building in the *renaissance* style, outside the main building and adjoining the Art Hall, two hundred and forty feet long, seventy-five wide, and twenty high, lighted both by side and top lights. The estimated cost of this erection is twenty thousand dollars, of which only ten thousand was subscribed when the time allowed by the Commissioners for its collection expired; but an extension of two months having been obtained it is hoped that the entire sum required may yet be subscribed, and that the Photographic Hall may be a success.

To prevent as far as possible loss or damage to the exhibits of German photographers it is proposed that they be all collected at Berlin and despatched thence to Philadelphia. The Berlin Photographic Society having applied for a hundred square metres of wall surface German photographers will send their applications for space to the Society's Exhibition Committee at Berlin instead of direct to the American Commissioners. Twenty-two photographers are already mentioned in the *Mittheilungen* as having intimated their intention of exhibiting, amongst whom we observe the names of Herr Albert, of Munich, and M. Braun, of Dornach.

A photographic exhibition is to be opened at Calcutta in February, 1876, at which four gold, six silver, and one bronze medal will be competed for. Exhibits to be sent by the end of December, 1875, addressed to Captain Waterhouse, Bengal Staff Corps, Calcutta.

Count Ludovico de Courten describes in the *Moniteur* a piece of apparatus called the "*polystéréorama,*" the invention of M. L. A. Funajoli, who is said to have made a reputation in England by his new style of bas-relief portraits. The *polystéréorama* is simply an instrument for viewing photographs or other pictures, whether stereoscopic or single, irrespective of size. It is provided with a movable diaphragm, which is made to hide the edges and the

mount of the picture, giving an increased effect of perspective. In this manner small pictures are made to have all the effect of large ones. By means of various mechanical arrangements the illumination may be so controlled and altered as to give the effect of twilight, night, or sunlight at pleasure. The instrument is of imposing size, elegant appearance, and forms a piece of furniture in itself.

Herr Fusher gives the following formula for rendering paper or prints temporarily transparent:—

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| Castor oil | 1 part. |
| Alcohol | 2 to 3 parts. |

Plunge the paper for a few seconds into this bath, and when the alcohol has evaporated it will be found quite transparent (?). To restore the paper to its original state soak it in methylated alcohol, when the oil will redissolve and the transparency disappear.

The *Journal de Photographie*, speaking of a remark made by the editor of a Belgian journal to the effect that water added to collodion has the property of preventing abnormal deposits upon the film, asks its readers to report their experience in this direction. While unwilling to contradict the observation of his Belgian *confrère* the editor of the *Journal de Photographie* attributes the result rather to the skill of the operator than to any virtue conferred by the water.

The *Journal de Photographie* publishes a new formula for salting paper, which gives extremely rapid results. It is as follows:—

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|---|---|
| Chloride of sodium | 1 ounce. |
| Nelson's gelatine | 1 „ |
| Orange juice | 1 „ |
| Water | 40 ounces. |

The paper is plunged into this bath while warm and allowed to soak for one minute. It is extremely sensitive, an exposure of five minutes in sunshine being sufficient. Nothing, however, is said about the strength of the sensitising bath or the length of time the paper is to be floated.

Herr Hauck recommends an alcoholic solution of citric acid for preserving sensitive paper for several weeks. One part of the acid is dissolved in forty-eight parts of alcohol. The paper must be thoroughly dried before floating on the acid bath. The printing proceeds rapidly, and the toning is effected by means of a solution of gold rendered alkaline by means of carbonate of soda.

## ON BACKGROUNDS AND PORTRAITS COMBINED.

In the numerous plans suggested, worked, or patented for the production of landscapes or interiors in combination with portraits taken in the studio one matter of the utmost importance is frequently lost sight of, or, if not, considered but secondary, and that is the harmony and subjectiveness of the background and accessories to the figure. Everyone with any pretensions to artistic feeling agrees that this is a requisite condition, and yet few put it in practice, for the difficulty of doing it is very much greater than might be imagined. It is simple enough to say "do this," but not so easy to carry out the instruction, although one may set to work with the best intentions. In some processes highly praised the thing is an utter impossibility, the very nature of the process being utterly incompatible with the desired result; and, without this quality, no matter how dexterously the join may have been effected, the result cannot be otherwise than bad—worse, by far, than if the background had been left a blank, without even the redeeming shadow.

It is an axiom with artists that some portion of a picture should be left to the imagination—that pictures should possess the quality of suggestiveness in addition to the visible and definite, the value of the work being much influenced by the greater or less skill with which such suggestiveness is effected. A picture, to use a familiar expression, should "grow on you;" if it do not, depend upon it the oftener you see it the less you will like it, till at last the picture you once admired will be contemptuously put aside as commonplace—the very thing it was undoubtedly from the first. This applies more expressly to photographic than to other pictures; for the production of detail is photography's strongest point. There naturally exists a disinclination to sacrifice one iota of this quality, and to this reluctance may be attributed the frequent failures that are met with in small composition pictures.

I myself believe—and I speak from considerable experience with most plans for producing composition work, having for several years managed the preparation of the small pictures sent out by Mr. Edge, of Preston and Llandudno, and so favourably criticised—that the production of a portrait in the studio with a natural background or interior on *one* plate is but a waste of time if the higher class of work be aimed at. No matter what the process perfect success will be only a "fluke," and the regular work consist chiefly of failures. Providing clever joining be the sole object aimed at many of the published processes are excellent; but as a means of introducing accessories into a portrait-subject no plan at present used is so effective and artistic as printing from separate negatives—in fact, no plan has been at present devised that can assume artistic excellence in any other way. The trouble of doing this naturally makes one wish for an easier and more expeditious method. At the same time this necessary trouble is amply repaid by the superior excellence of the results; and we might almost as well desire to paint pictures by machinery as to make photographs of the highest standard with no more trouble than turning over the presses when sufficiently printed.

It is some consolation to think that in photography mechanical skill is not the *only* thing required, and that it is possible to show individual skill in our favourite kinds of work independent of any mechanism whatsoever. Almost every different pose of a figure demands some alteration of the lines of the background to ensure the most artistic result. This adjustment is one of the weak points of a "compound negative," and subordination and gradation are others—all of which are comparatively easy when the adaptation is effected in printing; and the *multum-in-parvo* negative at present is, except for amateurs and those professional photographers who prefer infinite trouble to infinitesimal results, a plan not yet sufficiently perfected. EDWARD DUNMORE.

## ON COLLODION FOR THE DRY PROCESSES.*

In the first attempts to prepare a collodion suitable for dry processes it was found that there were advantages in making use of materials like rotten cambric, shreds of filtering-paper, old lint, and other like substances in which the cellulose has undergone partial disintegration by the action of chlorine, caustic alkalies, &c., a pappy and broken-up structure of collodion being more easily obtainable in that way than by working with the fine cotton-wool as it exists in the raw material. Nothing, however, will be said in the present paper on the use of these bodies, since it is now well established that both uniformity of product and stability of collodion are, to a great extent, sacrificed by their employment. All must be done, therefore, with the best cotton-wool, and we must look to the nitro-sulphuric acid for bringing about the physical and chemical modifications required.

The first experiment which gave me a clear idea of the *rationale* of producing collodion suitable for dry processes was made at the time when so much was said of Gaine's process for making vegetable parchment. It occurred to me to try how this modified cellulose would succeed in the preparation of pyroxyline, and I therefore cut a piece of paper into several slips, and floated them upon the diluted oil of vitriol for varying periods of time—five, ten, fifteen, twenty, forty seconds, and soforth, afterwards washing with water, and drying each piece perfectly. The shrinking and toughness of the paper appeared to increase with the time on the acid, and, in the case of the pieces last removed, there was a peculiar jelly-like feeling whilst they remained in the washing-water, as if a chemical change had commenced. Now these pieces of parchmentised paper, on being subsequently dipped in nitro-sulphuric acid at 130°, all yielded pyroxyline soluble in ether and alcohol; but there was a marked difference in the quality of the collodions so made, for whilst the earlier samples gave a fine and tough film, the later ones—those left longest on the sulphuric acid—produced a collodion which is known as "*powdery*," rubbing up under the finger like soft soap, and adhering very tenaciously to the glass. The inference was that the parchment collodion resulted from the first or action proper of the sulphuric acid, and that the powdery pyroxyline was due to a subsequent or disintegrating effect of the same acid, which, perhaps, might be a partial change into dextrine. At the time it seemed to me logical to draw the above conclusion, but I shall now proceed to show that it is not correct—that the nitric acid, and not the sulphuric, produces the powdery film.

When it became evident that the sulphuric acid exerted a modifying action in the manufacture of pyroxyline, the next question was whether a mixture of oil of vitriol and nitric acid could be made in such proportions as to produce at once the full effect, and so to yield a product corresponding to that which is obtained when the fibre is first parchmentised and afterwards made into a substitution-compound by nitric acid. If this were possible the action of the sulphuric acid must precede that of the nitric acid, because, although it is easy to make the vegetable parchment into pyroxyline, yet pyroxyline, once formed, cannot afterwards be changed in properties by immersion in diluted oil of vitriol, but is protected and remains in the acid without shrinking. Therefore, in order to give the preponderance to the sulphuric acid, we make the bulk of that acid relatively greater, and in this way the parchment quality of collodion may be obtained.

If, however, the theory above propounded were correct—that the action of the oil of vitriol has two stages, a condensing and a dis-

* Agreeably with a suggestion made by Mr. Hardwich, in a short communication in our "Correspondence" page, we here reprint his article published in 1860.—Eds.

integrating stage—it ought to be quite possible to prepare the porous or soapy pyroxyline in the same acid mixture which is found to answer for the parchment pyroxyline, and especially since we have it in our power to increase the action of the acids *by raising the temperature.* Experiments, however, afterwards proved that this mixture of three measures of oil of vitriol to one of nitric acid was not the best for preparing the most powdery kind of film, and that no increase in temperature or alteration in the proportion of water sufficed to give the desired result. Nothing remained, therefore, but to consider the theory afresh, and on doing so the weak point soon came to light, viz., that I had overlooked an effect of the *nitric acid* not hitherto described, and that, to produce the pulverulent state of film in perfection *in one mixture,* the nitric acid ought to be in excess over the sulphuric.

It appeared, however, that the most complete disintegration resulted when the nitric acid was brought to bear upon cellulose which had previously been acted on to the full extent by oil of vitriol; and this explains why, in the experiments with the strips of parchment paper, the latter samples of collodion were so entirely porous, viz., those produced from the material which was at the verge of transition into dextrine before it entered the nitric acid.

Having perfected the theory, it now corresponds with the experimental results, and either quality of collodion becomes obtainable at will; for, if in a mixture of three measures of oil of vitriol, one of pure nitric acid of 1·45, and rather more than three-quarters of a part of water, there be immersed cotton, at 150° F., the fine, transparent, tough material containing a minimum quantity of the peroxide of nitrogen is prepared, to convert which into the powdery pyroxyline we have only to dry it, and dip it for an instant in a mixture of the same acids, and at 150°, but with the proportions reversed, viz., three measures of nitric acid to one of sulphuric, in place of three of sulphuric to one of nitric, the water in the formula being omitted.

In this process a very short immersion of a few seconds suffices, and there is not much loss from solution; the pyroxyline does not gelatinise in the hot nitric acid, and can afterwards be easily washed in water, but it loses nearly all its tenacity, and flies about in dust when it is dried and rubbed by the finger. Its properties undergo an important change as regards the action of solvents; for, whereas it was before unacted upon by absolute alcohol in the cold, it now liquefies into a gummy mass on treatment with this liquid. In collodion the properties differ widely from those of the parchment pyroxyline, the latter setting firmly and quickly upon the glass, but the former being nearly deficient in power of setting; so that, if the proportions of the ether and alcohol remain the same, when you allow five seconds in the one case before dipping the coated plate in the bath, sixty seconds would be required in the other. The parchment pyroxyline forms a somewhat opalescent film on dipping in the bath if the collodion be only moderately iodised, but the powdery pyroxyline produces a dense and creamy film under the same circumstances. If these films be washed with water and dried the former has a varnished appearance and may be rubbed with the finger without injury; but the latter is lustreless and seems to exhibit the iodide upon the surface rather than in the substance of the film. When the sensitive plates are washed with water, and reared up on blotting-paper to drain, the parchment collodion soon assumes a condition in which it is not easily wetted, but the pulverulent film remains without much change, and a solution of albumen or a developing fluid flows quite up to the edge without receiving any check.

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We now pass on to examine the action of these collodions in the dry processes, taking in preference those of Taupenôt and Fothergill; and I may mention that the majority of my experiments have been made with the Fothergill process, inasmuch as the plates are readily prepared, and show very characteristic differences in development. It was stated by Dr. Norris, in his early papers on the dry process, that a powdery structure of collodion allowed a ready penetration by liquids, and so favoured quick development. This may be true to a certain extent; but, in my own experience, I have found that energy of development depends much upon other causes independent of physical structure. On comparing the horny parchment collodion with that in which the film is made porous in the mode previously described, it is evident that both yield feeble images when newly iodised, but that the powdery collodion does so especially; not that this image developes more slowly than the other—on the contrary, it comes out rather rapidly—but it has a peculiar *grey tone,* such as would be produced by nitric acid in the bath. This metallic aspect of the image depends upon the pyroxyline, and has nothing to do with imperfect washing or impurities in any form, which should be carefully guarded against in an investigation like the present. The weaker the acid, and the more powdery the film in consequence, the worse the defect; and in reflecting on the cause I was led at length to attribute it in part to the peculiar manner in which the iodide is precipitated in a film of this structure, for on one occasion the whole picture dissolved off into the fixing bath, leaving the collodion intact upon the glass, thus rendering it evident that the iodide of silver was not imprisoned by the pyroxyline in the usual manner, but simply rested upon its surface. To overcome this the same pyroxyline was dissolved in a mixture consisting principally of ether, with only a small quantity of alcohol in the absolute state, and iodised with the cadmium compounds in preference to those of the alkalies. By this proceeding a more contractile film was obtained, which bore rubbing without losing its iodide, and on trial it was found that the intensity of the image was decidedly increased, a brown tone having taken the place of the grey.

As the question of colour and intensity of image is of importance, I shall not leave it without making a few more remarks. Why would the fact of the iodide of silver resting merely upon the surface of the film in the case of the powdery collodion be calculated to lessen the density? Probably because the pyroxyline made in the way I recommend is not altogether inert to the salts of silver, but has somewhat of that action which we find possessed by albumen and many other organic bodies of increasing the intensity of the developed image. This position I am quite able to maintain; and if we allow it to be true it suggests the importance of having the iodide *in* the film as well as upon the surface.

We now pass on to consider the effect of keeping the collodion for a time in the iodised state before using it; and I may mention that in the experiments a portion of *bromide* was associated with the iodide, not only because it has a more decided action in carrying down organic matter and fixing it upon the film, but also because the use of bromide in the dry processes does not retard the development or make the image metallic, as it does in the wet. The bromide and iodide of ammonium and cadmium in the proportions used for positive collodion form a mixture very proper for the purpose.

The horny collodion newly iodised is extremely sensitive in Fothergill's process; but the image developes somewhat feebly, and with a long-focus lens in a subdued light there would be a want of contrast. This condition of collodion does not allow of too much washing before the albumen is laid on, otherwise the above-mentioned defects increase and the development becomes difficult to manage. Old iodised collodion differs in this respect from new—there is more decision and contrast in the picture; and, supposing the preparation to be in the right state, the plate may be washed rather freely with water previous to the application of the albumen, without interfering much with the intensity. This, therefore, is the point to which my attention was directed.

Whatever be the exact nature of the change which takes place in collodion after iodising with the alkaline iodides, we cannot doubt that in its essential features it consists in the pyroxyline displacing a portion of the base, and in some manner neutralising it. We therefore strive to imitate this change by adding a portion of free alkali to the collodion; and, as far as my own observations extend, the effect of all the alkalies and alkaline carbonates is nearly the same, photographically speaking. If there be a difference it is rather in point of time and in rapidity of action than in any more essential particular.

Taking a sample of the horny collodion made as before described, I add to each six drachms two drachms of absolute alcohol in which has been dissolved a quarter of a grain of pure potash free from carbonate. The liquid immediately becomes ropy, and, with a less proportion of alcohol, semi-gelatinous. In a very short time, however, the ropiness goes off, and the collodion is then rather more limpid than previously to the use of the potash. At this stage a few drops of an alcoholic solution of nitrate of silver, added to a small portion of the collodion in a test-tube, produce a *white* turbidity. If the cloudiness should be white at first, but afterwards assume an olive-brown tint, a portion of the potash still remains in the collodion in a free state. Perhaps the safer plan will be to allow the action to continue for twenty-four hours, after which the precipitate produced with nitrate of silver will be quite white, and it then remains only to dissolve in each ounce five grains of iodide of cadmium and one grain of bromide of ammonium. If these proportions should produce *a blue film,* to which there is always a tendency in collodion having undergone decomposition, they may be increased.

The photographic properties of collodion modified in this way are very remarkable, and, on making trial of it in the dry processes, we see at once that an important change has been produced. The tendency to active development is so strong in Fothergill's process that it matters very little in this respect how far the washing is carried before putting on the albumen; for, even if the free nitrate of silver be fully removed by copious treatment with distilled water, there is no difficulty in obtaining a dense picture. In the oxymel process the plates develope with a bloom and ruby-red colour like wet collodion, and are in danger of running into red solarisation. I notice also a clearness and brilliancy in the image, such as usually accompanies a state of film giving intense development; the action of the reducing agent seems so strongly determined towards those parts of the film which have been touched by light that it expends itself, and hence the shadows are preserved in a state of transparency.

There is one objection to the use of alkali in the manner now advised, viz., that the collodion is rendered very tender. The state produced cannot properly be called *"powdery;"* a more correct term would be *"rotten."* If ammonium compounds be afterwards used in iodising, the film, already weakened as far as it will bear, sometimes gives way, whilst if cadmium salts be substituted the adhesion to the glass is lessened and the collodion wrinkles during development. This tendency may be overcome by applying a preliminary coating to the glass, after which the working of the collodion is everything that could be desired. Those who are conversant with the peculiarities of the different kinds of

collodion employed in the wet process will readily understand that the state of film now under discussion sometimes fails in rendering the half-tones, and that a hard quality of picture may be produced unless the proper conditions be understood.

Before passing on to consider further the chemical nature of the changes which take place by the action of alkalies on collodion, it may be well to observe how cautious we should be in recommending any new step in photography without stating all the conditions. The addition of potash, for instance, is a most hazardous proceeding, and one which may bring disappointment. The mode of preparing the pyroxyline must be taken into account, since some kinds are much tougher than others, and will resist a larger quantity of alkali without becoming limpid. This I show by taking three kinds of collodion—*a*, from parchment pyroxyline; *b*, from cotton-wool immersed in hot and weak nitric acid with minimum of sulphuric acid; *c*, from pyroxyline made out of calico. On adding a similar quantity of alcoholic solution of potash to each the first becomes glairy and subsequently liquefies to the proper consistence, turning, at the same time, slightly yellow. The second remains colourless, and precipitates a thick white substance, above which floats a limpid liquid almost free from dissolved pyroxyline. The third behaves differently from either, being liquid from the first, and not passing through the ropy stage.

The action of potash upon pyroxyline is decidedly complex, and, although Mr. Hadow has interpreted it under certain conditions, it does not appear to me that the reactions are the same when the alkali is employed in a minute quantity and at a low temperature, as I advise. One thing, however, is clear that, under all circumstances, *nitrite* of the base is formed; and, indeed, I have seen definite crystals of nitrite of potash in residues of iodised collodion after fourteen months' keeping.

An alkaline nitrite, such as that of potash or soda, precipitates a white compound with nitrate of silver; and this substance is only sparingly soluble in water. Therefore, if we suppose a collodion to contain nitrite in addition to iodide, the film, after removal from the bath, may be expected to bear a very large amount of washing without entirely losing its soluble silver salt. The effect of nitrite in the *wet* process is to accelerate development, and to increase the contrast between the extreme tints. I find that it acts in the same manner in the dry process, and hence it may prove of service in some cases.

Collodion containing nitrite even to saturation does not produce the same decision of image as that to which potash has been added. This I attribute in part to the fact of *organic decomposition* of the pyroxyline being produced by the potash, which renders it more difficult to wash out all the soluble silver salt. The subject is a difficult one and needs more investigation, but I will mention a few facts that bear upon it. There are organic substances which produce no precipitate in solution of nitrate of silver, and yet can be shown to combine with it in a loose and ill-defined way. One of these bodies is *gelatine*, as the committee who reported on the subject at the late meeting of the British Association have shown. If a sheet of gelatine be dipped in a nitrate bath no subsequent washing will altogether cleanse it from the nitrate of silver; on the other hand, gelatine will withdraw nitrate of silver from its aqueous solution and appropriate it to itself. The substance produced may be termed "gelatino-nitrate of silver," and one of its properties is that it has the characteristic bitter metallic taste, but gives no precipitate with a minute quantity of chloride of sodium. I find, also, that *powdered gum arabic*, on being digested in alcoholic solution of nitrate of silver, retains some of the nitrate most obstinately; for, if the gum be dissolved in water (after repeated boiling with fresh portions of spirit until nothing more can be extracted), the solution has a strong, bitter taste, and remains clear for a time on the addition of chloride of sodium. A third experiment was conducted as follows:—Pyroxyline of that kind which has been fully acted on by the sulphuric acid in the process of manufacture, and which the experience of photographers shows to give an unusually intense image in the negative, was soaked for one hour in an alcoholic solution of nitrate of silver, in the dark. It was then washed very carefully in about twenty changes of distilled water, the washing being continued long after all traces of free nitrate of silver had disappeared; nevertheless, this pyroxyline, on being dissolved in ether and alcohol, gave a brown turbidity with hydrosulphate of ammonia, and on being treated with salt remained nearly clear at first, but afterwards became slowly opalescent.* It must be confessed that the above experiments are, with the exception of that in which gelatine is used, of an extremely delicate nature, and could not safely be depended upon if taken alone. Viewed, however, as corroborative of other undoubted facts they are interesting, and since the photographic and chemical results tally so exactly with each other we may safely affirm that, although pyroxyline is usually viewed as indifferent to salts of silver, yet that there are some varieties of that substance which are more or less organic in their reactions; and, further, that any sample of proxyline, after undergoing partial decomposition by action of alkalies, will abstract a portion of nitrate of silver from the bath, independent of the presence of nitrite, chloride, or iodide. Pyroxyline in this state takes its place as the lowest member of that class of photographic substances containing albumen, &c., all of which are useful in processes where the plate is washed with water previous to its exposure in the camera.

At the outset of this investigation I had hoped to perfect a method of purely dry collodion without any preservative substance applied to the surface of the film, but at present I am not so sanguine of being able to do so. The principal defect of Fothergill's process is the slowness of development, which appears to be due in part to the film drying up and not recovering its porous condition on being wetted. Gum or gelatine prevents this; for, although the film shrinks as before on drying, yet when water is applied it returns to the spongy or villous state which it had on first leaving the bath, and the development is accelerated. The experiments I have made confirm all that Dr. Norris has advanced; but they lead us a step further, for it is now impossible to deny that these preservative substances have a chemical as well as a mechanical action, and that the colour and general aspect of the image will vary with the particular organic substance which is selected.

F. Hardwich.

* A pure solution of nitrate of silver throws down a precipitate immediately with chloride of sodium; but when these organic substances are present either no precipitation whatever occurs or the liquid remains clear for a time and afterwards becomes gradually opalescent. In the same manner collodion prepared from that kind of pyroxyline of which we have been speaking may contain a weighable quantity of chloride of cadmium, and yet on dipping in the bath no precipitate may be produced, the film remaining clear and transparent.

## OPINIONS OF THE DAILY PRESS ON THE PHOTOGRAPHIC EXHIBITION.

Photography.—The opening of the Photographic Society's Exhibition in the Water-Colour Society's Gallery, with an unusually excellent collection of examples of recent photographic work, principally English, though with a few specimens from Germany and California, presents an opportunity for calling attention to some remarkable applications of photography in which Germany has, of late, very decidedly taken the lead of England. We see no indication of any superiority in the work of German photographers over English, either in the taking of portraits or views from nature. Judging by the remarkably elaborate full-length portraits (15-17) sent to this exhibition from Dresden by Hugo Thiele, and the Viennese and Berlin examples so familiar to all of us in the shop windows, we see in German photographic portraiture, along with a great deal that is showy and effective, no little that is objectionable in taste and exaggerated in light and shade. We have never seen any German portrait-photographs comparable with the best examples of our own best men, as, for example, to confine ourselves for the present to the Photographic Society's Exhibition, Mr. Blanchard's portrait of *Salvini* (96), the only one of the innumerable photographic pictures of the famous Italian actor which, to our mind, gives the head its real dignity and impressiveness, without any melodramatic exaggeration; or Mr. R. Faulkner's exquisite studies of children on porcelain, and one frame of enamels by him (70, 323, 396-7), which, by the good taste of their arrangement and *pose*, as well as their success in rendering the charm and grace of childhood, recal the pictures of Sir Joshua. That Mr. Faulkner occasionally confesses to an intentional imitation of our great portrait painter does not detract from the beauty and attractiveness of his work. As if to enforce by contrast the beauty and innocence of childhood Mr. Faulkner's large frame of studies from children (396) has been hung opposite to two of the most remarkable collections of villainous physiognomies we have ever seen recorded by the unflattering pencil of the sun (407-408), being physiognomical studies of criminal men, women, and children, contributed by Mr. S. G. Payne, of Aylesbury. This is an employment of photography certainly not contemplated by its inventors, but by no means one of its least practical uses. The practice of photographing prisoners is now common, and serves a doubly-useful purpose, helping indentification and recording improvements in the few cases where there is any to be recorded. For the student of physiognomy in its more repulsive aspects these Aylesbury frames will have a painful attraction. Though still enough and to spare, there are this year fewer life-size portrait photographs than usual, for which we must express our gratitude to the arrangers of the Exhibition, and fewer than we have been accustomed to look for of attempts to make pictures by means of the camera. In one instance we were struck by as near an approach to a picture in a composition of photographic portraits as is compatible with the conditions of photography. This was in an exceptionally well-arranged group (119) of two female full-lengths, by Mr. R. Slingsby, Lincoln, in which the composition of the figures and the arrangement of the furniture are alike happy and tasteful, and all the objects introduced seemed to fall into the picture without forcing. But there are not wanting many examples of posed groups as bad as this particular one was good. Indeed, to succeed in such groups requires in the photographer a rare amount of artistic knowledge, the immense value of which is very strikingly shown in the work of Mr. Faulkner and Mr. Slingsby to which we have referred. We do not purpose any detailed review of the landscape photography in the Exhibition, but we must congratulate the Society on its high average quality both in the choice of subjects and the perfection of the photographic work. Of especial interest, as illustrating the value of photography for record of nature and archæology, are the admirable views in Egypt and in Knole Park from the Royal Engineers' School of Photography, conducted to such excellent purpose by Captain Abney at Rochester, and the series of beautifully-executed views in New

Zealand, taken by Mr. D. L. Mundy, during a toilsome three years' traverse of the islands with his photographic apparatus on pack-horses. Mr. J. S. Stoddart's cloud studies (381) should also be noticed, as likely to be not less useful to the artist than the many elaborate studies of foreground foliage and trees which photography has placed at his command, and which the painter nowadays often loves not wisely but too well. The fine study of a huge greenstone boulder on the beach at Hokianga, from Mr. Mundy's series, and two frames of enlargements of microscopic objects are among the few examples here shown of photography put to philosophic uses, as the two frames of reproductions of lace are of its application to industrial art. The Society's exhibition this year is, indeed, rather interesting for its many illustrations of methods of printing and enlarging, most of them developments of the autotype and Woodbury processes, than for its examples of new or varied applications of photography. Strange to say, besides a few indifferent reproductions of foreign pictures from the International Exhibition, by W. England (136-140), there is only one specimen on these walls of a photograph from a modern picture. This is (194) an excellent photograph by Mr. Hollyer (who also sends some of the best animal studies in the exhibition) of a graceful full-length figure of Mr. Albert Moore. There is not a single reproduction of an old picture. And this brings us to the work in which German photography has so completely taken the lead of English, viz., reproduction of the old masters. France may vie with Germany in the use to which she has turned photography in lieu of engraving for contemporary art. Messrs. Goupil and Co. annually produce a photographic record, on two scales, of the most important works in the Salon of Paris. Partly from the *esprit de corps* which reigns among the French artists of all kinds, and partly from the smaller market value of copyrights there, they are enabled to command, with very rare exceptions, every work of most interest for their photographic albums; and these now form a record of the Salons quite unequalled for interest and completeness, enabling the stranger to follow the movement of modern French art at small cost, and forming the prettiest and most interesting of all drawing-room gift-books. This year, for the first time, something of the same kind has been ventured upon in England, the Fine-Art Publishing Company (4, Rathbone-place) having produced an album of fifty-two photographs from this year's Academy. As a first year's essay the volume is highly creditable. German photography in no way falls short of French in its work of reproducing and popularising contemporary Teutonic art. Every picture that attracts attention in a German exhibition is speedily and admirably photographed, and disseminated not only over Germany, but through France, England, and America, at a price which puts it within the reach of all, and in several sizes suited for the album, the portfolio, or the picture-frame. The Berlin Photographic Company is at the head of this good work, and their agent in London, Mr. Gerson, of Rathbone-place, has a vast and constantly-growing collection of their photographs from modern German pictures, which really are, as a rule, more attractive than the originals, for they give us all the artists' best qualities of subject, expression, and generally well-studied composition and arrangement, while they mask the weak point of most German painters and schools—colour. We are unable to say whether the peculiar beauty and singularly-harmonious effect of both the French and German photographs from modern pictures are due to an understanding between painter and photographer, by which the painter makes a study in monochrome after his picture, from which the photographic negatives can be taken without sacrifice of the colouring. In some cases we know this is done, and it may go some way to account for the rare excellence of the photographs from French modern pictures published by Messrs. Goupil, and those from German pictures brought out by the Berlin Company. Something also may be due to the lower key of colour usually adopted both by French and German painters. But this reproduction of contemporary pictures is not the chief nor the most remarkable work undertaken by this enterprising German association. They have published, or are now publishing, photographs in various sizes, directly taken from the masterpieces of the principal galleries of Europe. We have before us a portfolio containing their photographs on the largest scale from some of the finest examples of Raffaele, Holbein, Velasquez, Vandyke, Rembrandt, and other famous masters in the Dresden Gallery. They have done a similar work for the most famous pictures of the Pitti and Uffizii, the Louvre and the Berlin Museum, and our own National Gallery. It is hard to understand by what means these enormous negatives are taken and printed from. They are evidently made direct from the picture, and in some cases seem of the same dimensions, or but little less. But a still greater wonder is with what a small sacrifice of colour the photographic copy has been taken. One part of the secret, we believe, is the high artistic skill of those who superintend the work, the patience and leisureliness with which the copying is conducted, and the facilities wisely given for it by the Directors of the Galleries. Whatever may be the means employed the result is such as our readers, unless they may have seen these Berlin prints, would imagine to be quite unattainable by any application of photography to the works of the old masters. What engraving of the beautiful Madonni di San Sisto—though we have the masterpieces of men as famous as Müller, Steinle, and others to choose from—can stand comparison for a moment with this large Berlin photograph, which gives us, in one sheet, the head of the Madonna with the Child, in another the Angels who wait upon the threshold, in others the Pope and the Santa Barbara, of the same size as the originals, if our eyes do not deceive us, and bringing back to us all the overpowering dignity and beauty of that masterpiece of its painter? So with Holbein's wonderful bust portrait, which bears the name of Hubert Morett in the same gallery, and those most characteristic heads by Velasquez, Rembrandt, Rubens, and Vandyke, including his finest portraits of Charles the First and Henrietta Maria. Here is the very touch of the master—nay, the grain of his canvass—reproduced for us with a fidelity that helps to recal, till it almost seems to replace, the colour. Here are his lines given with a precision that mocks the hand of the most skilful and laborious engraver. Moreover, whereas the work of the latter reminds us, first of him and only afterwards of the master whose work he translates, here we are carried at once and irresistibly back to the picture with no thought of the agency which so transports us. Some sacrifice of colour there may be, but the loss is insignificant in comparison with what we gain by this marvellous exactness and direct suggestion. But how, it may be asked, about the durability of these photographs? We are assured that it may be depended on; and we know that in the autotypic process there is assurance against fading. What the Berlin Company have done for the gallery pictures of the old masters, the chief German patentee of the autotype process, Herr Braun, of Dornach, on the Rhine, has done for their drawings and frescoes, particularly for the great mural decorations of Michael Angelo, but these we have no space at present to describe.—*The Times*.

# Meetings of Societies.

## EDINBURGH PHOTOGRAPHIC SOCIETY.

An outdoor meeting of this Society took place on Friday last, the 1st inst., the scene of the members' operations being the mansion and grounds of Bonally, the residence of the late Lord Cockburn, and occupied by Professor Hodgson, of the Edinburgh University.

Bonally, the outcome of the genius of Lord Cockburn, is situated at the foot of the Pentland Hills, within an easy distance from Edinburgh, and is, from a photographer's point of view, one of the finest places in the country. The house—"Bonally Tower," as it is called—originally a simple farmhouse, was added to from time to time by Lord Cockburn as the exigencies of an increasing family required, the result being an imposing pile of Scottish baronial architecture of exquisite beauty, in complete preservation, and surrounded with all that goes to make up a perfect picture. The grounds, which extend a considerable way up the face of the hill, are laid out with great taste, and contain some fine specimens of rare pines; while ancient statuary and sculptured vases are found here and there in just sufficient number to adorn, without detracting from, the natural beauties of the scene. Nor is the charm of running water wanting; a stream comes down from the hills and has been utilised with much taste. It has been made to flow through the grounds in various directions; here widening into a tiny lake, there crossed by an artistic bridge, and in various places the levels have been so adjusted as to form pretty cascades, the whole forming, as we have already said, one of the most charming spots for "a day with the camera" that is to be found in almost any part of the country.

The party left for Colinton Station at 10.5 a.m., and walked from thence to Bonally, which was reached a little before eleven o'clock. The road from the station is bleak enough, and gives but little indication of the charms of the place; but almost immediately on passing the entrance gate the beauty of the prospect bursts like a vision on the eye, and the spectator can hardly realise the fact that he has not been transported to fairyland, so great is the contrast, here at least, between nature left to herself and nature aided by the handiwork of an educated and cultivated taste.

The cameras were at once unpacked, and all turned toward the perfect picture here presented, which consisted of the main tower with its ivy covering in the centre, a foreground of well-kept and picturesquely-arranged flower-beds, and to the right and left some fine specimens of pines, intermingled with artificial cascades. The plates were beer and albumen and emulsion; and, as long exposures were to be the order of the day, after the removal of the caps a deputation was despatched to "interview" Professor Hodgson, and to seek his permission, which, so far, had been taken for granted. Unfortunately the Professor was from home; but, in response to the cards of the deputation, Mrs. Hodgson appeared, and gave the party a hearty welcome to roam about at will and photograph whatever might attract their fancy—a permission which was taken advantage of to the full, the result being the production of a number of excellent negatives, which, no doubt, will be turned to account at some of the popular evenings which form so interesting a feature in the work of this Society.

Rarely do such excursions pass without some mishap occurring, and this one was no exception to the rule. One of the members, who seems to ignore all modern improvements in the shape of double slides or changing-boxes, and who sticks to what he considers the good old method of changing his plates in a bag, came suddenly to grief in a way that will probably induce him to somewhat modify his opinion and

practice. He had finished his work, and covered the plate-box with the changing-bag—or rather partly wrapped it into it—and by and by, forgetting it was there, attempted to lift the bag, when a rattle of glass was heard, and, on turning round, his day's work was seen scattered on the ground. The catch of the plate-box had got out and, of course, every plate was spoiled. His face was a study that would have pleased, and could only have been fully done justice to by, a Rejlander. Being somewhat of a philosopher, however, his disappointment soon passed away, and the only expression made use of was—"Well, I always intended to have a lock put on that box, and I suppose I must have it done now. It's a blessing I hadn't the large camera!"

It has been already said that the exposures were intended to be on this occasion exceptionally long, the object being a twofold one—first, not so much to get many pictures as to make sure that those obtained would be really good; and, secondly, to give plenty of time for the full enjoyment of a day out in the open air and on the grass on a glorious autumn day—to, in point of fact, try the recommendation so kindly, although somewhat indirectly, given by Mr. A. W. Steele, of Leith, to "rest their weary eyes on nature's greenery, and enjoy on a heathery knoll the soft recumbency of outstretched limbs." This they did to the fullest extent, not forgetting to bless the man who had thus shown them the true way to enjoy the beauties of nature in the combination of work and pleasure.

Early in the afternoon the party proceeded to Colinton village, where some plates were exposed, and much kindness shown by Mr. Burton, the celebrated engraver, into whose garden they had gone because it was a capital standpoint for a picture of the valley, and without, of course, knowing to whom it belonged. Mr. Burton had worked the daguerreotype process in the early days of photography, and he showed his visitors a fine collection of specimens of that style—the most beautiful of all processes—as well as his collection of pictures and curiosities, and sent them on their way rejoicing. From Colinton the party worked their way down to Slateford, in the Caledonian Inn of which they wound up the proceedings of the day with a first-rate tea, to which all did full justice.

While tea was being prepared an ordinary meeting was constituted; but as another was to be held in the usual place of meeting on the 6th instant no business was transacted, and, after tea, the party took the train for Edinburgh, which was reached about 6.30 p.m. All were highly pleased with the proceedings of the day.

## LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The monthly meeting of this Association was held on Tuesday evening, the 28th ult., at the Free Library,—the Rev. J. D. Riley, President, in the chair.

The minutes of the previous meeting were read and passed.

Mr. J. A. Forrest feelingly alluded to the loss the Society had sustained owing to the death of one of its oldest members, Mr. Robert Cooke.

Prints and negatives were exhibited by the Rev. H. J. Palmer, Mr. Forrest, Mr. Castellain, and the Secretary. Those by Mr. Palmer were views of the interior of St. George's Hall, Liverpool, taken on gelatino-pellicle plates with an exposure of about seven minutes, giving the most perfect detail even in the deepest shadows.

The Secretary strongly recommended the use of these plates for taking figures or groups in a landscape, as it was much more pleasing to return home with some views in which were depicted the likenesses of friends and companions. The short exposure required—being only a few seconds with a view lens—greatly lessened the risk of the figures moving while being taken, and the pictures were rendered doubly interesting and valuable.

It was arranged that a sub-committee consisting of the officers of the Society, with Messrs. Forrest and Phipps, should decide on the choice of a presentation print for 1875.

It was proposed and carried that at the next November meeting each member would be expected to produce specimens of his work during the past season.

A subscription was announced for the benefit of the widow of the late Mr. John Glover.

Mr. J. A. Forrest, who is treasurer to the fund, informed the members of the long and dangerous illness of Mrs. Glover, who, besides being powerless to do anything for herself, necessitates the attention of all her family. The late Mr. Glover was one of the founders of this Society, and for some time its secretary. Mr. Glover was one of the most energetic workers in the art, inspiring others to enter and further the advancement of amateur photography. He (Mr. Forrest) was sure that in remembrance of their old friend and in so good a cause he would not have to appeal to the members for their assistance in vain.

The meeting was shortly afterwards adjourned.

South London Photographic Society.—The first meeting of this Society for the winter session will take place at the House of the Society of Arts, Adelphi, Strand, on Thursday next, October 14, when a paper will be read by Mr. S. Fry, and one by Mr. H. Vander Weyde (on his new studio window).

# Correspondence.

## COLLODION FOR THE DRY PROCESSES.

*To the* Editors.

Gentlemen,—I sent you, quite recently, two short communications on collodion for the dry processes; but as I wrote entirely from memory, and it is now fourteen years since I held a bottle of collodion in my hands, it would, perhaps, be better to refer your readers to the original paper which I read before the London Photographic Society in January, 1860.

The general results of my experiments were that a very short and powdery pyroxyline was not the most suitable form to employ, but that a better development could be obtained with the ordinary tough and horny collodion partially liquefied by caustic potash. Dry collodion photography has made rapid strides since 1860; but a reprint of the paper in question may not be without interest, as it bears upon the subject lately discussed in your columns.—I am, yours, &c.,

F. Hardwich.

[In an earlier page of this number will be found Mr. Hardwich's communication alluded to above.—Eds.]

## EASY AND RELIABLE DRY PROCESS.

*To the* Editors.

Gentlemen,—In the last number of your valuable Journal a new dry-plate formula was given, which I believe answers every purpose one can expect.

I have been looking out a long time for an easy and reliable dry process. I have exposed several plates made with this formula today, and find them quite equal to my wet process, giving a very fine negative, full of details in the deepest shadows, without any intensifying.

I think it may not be out of place in your excellent Journal to give a reliable way of dissolving the fused nitrate of silver in the absolute alcohol without breaking the bottle and wasting the contents. My way is this:—I take a tin jar a little larger than the bottle, fill up very nearly half way with boiling water, place the bottle containing alcohol and silver inside, and boil over a spirit lamp, when in a few minutes all the silver will have dissolved.—I am, yours, &c.,

*Acton, October* 4, 1875. Thomas Coates.

## THE PHOTOGRAPHIC SOCIETY'S *CONVERSAZIONE.*

*To the* Editors.

Gentlemen,—A good deal has been written lately on the status of photographers, and various suggestions have been made for its improvement.

I can imagine nothing more prejudicial to the status of the photographic brotherhood than the fact of one of them being capable of writing the letter signed "J. Werge," appearing in your issue of last week. It was a stretch of your courtesy to admit it, seeing that it accused all ladies who attended the opening *soirée* of "donning semi-indecent dresses"—a coarse and most improper thing to say.

The statement about aping the tomfooleries of the upper classes (printed "follies" in the *News*—the editor, I presume, desiring to spare Mr. Werge unnecessary disgrace) simply proves that Mr. Werge knows nothing of the customs of learned and scientific societies, who invariably invite their guests to present themselves in the usual evening costume, and our President and Council were thus only following custom.

I deprecate earnestly the tone of such a letter as Mr. Werge's, and its allusion to the ladies is simply unpardonable.—I am, yours, &c.,

*October* 4, 1875. A Former Member of Council.

## TECHNICAL MEETING OF THE SOUTH LONDON PHOTOGRAPHIC SOCIETY.

*To the* Editors.

Gentlemen,—In reply to inquiries, permit me to state that the Technical Exhibition Meeting of the South London Photographic Society will take place at its usual monthly meeting, on Thursday, November 11, at seven o'clock.

Further particulars in due course; meantime, communications may be addressed to me.—I am, yours, &c., Edwin Cocking, *Hon. Sec.*

57, *Queen's-road, Peckham, S.E., October* 6, 1875.

## SILVER AMIDST CARBON.

*To the* Editors.

Gentlemen,—Your correspondent "J. S.," of Cheltenham, is amusing. What a quiet little dig he thought he would have at some "Carbon Company!" By the way, he perhaps means a Coal Company dealing in charcoal also, but they don't use nitrate of silver, so he must mean permanent pigments.

But the flagrant nature of the thing that a "Carbon Company" should use nitrate of silver!! Talk of the Bedford-row conspiracy! That is nothing to the dark deeds of a "Carbon Company, who profess to repudiate the use of silver," *using* one hundred ounces per week—whatever for unless to introduce surreptitiously silver printing in the guise of permanent prints! Don't be too suspicious, "J. S.," of Cheltenham; it will interfere with your peace of mind.—I am, yours, &c.,

*Autotype Works, Brownlow-road, Ealing Dean, W.,* J. R. S.
*October* 5, 1875.

## EXCHANGE COLUMN.

A head-rest, as good as new, offered in exchange for tent fittings.—Address, C. Lauri, 29, Lamb's Conduit-street, W.C.

Wanted, lantern slides or appliances in exchange for Marion's Saxe paper, Mawson's collodion, and two tubes of chloride of gold.—Address, J. S., 17, Okehampton-street, St. Thomas, Exeter.

Wanted to exchange, a whole-plate bellows camera and 1-1 Lerebours' portrait lens for half-plate, quick-acting *carte* and cabinet lens by a good maker.—Address F. H. L., Castle Cary, Somerset.

## ANSWERS TO CORRESPONDENTS.

Photographs Registered.—

John J. Frier, Dumfries.—*View of Sweetheart Abbey.*

James Cooper, Darlington.—*Two Views of the Joseph Pease Statue.*

☞ *Correspondents should never write on both sides of the paper.*

B. Smith.—Try the effect of adding a large proportion of sugar to the bath.

Gelatine.—The article by Mr. King to which reference is made will be found in our number for November 14, 1873.

A. B. C.—We are deficient in knowledge of the subject, and regret our inability to indicate any other source of information.

W. Horseman Kirkby.—We shall place ourselves in communication with the manufacturers of the burner, and may have something to say about it in our next number.

A. C. Caddy (Calcutta).—The enclosure has been forwarded. If you have not yet got rid of the fogging, try the effect of an addition of bromide sufficient to form a decided excess.

H. Anderson.—Two thicknesses of yellow calico would certainly answer, but one thickness of the very thinnest india-rubber cloth would suit much better. This, certainly, has been our experience.

Ignoramus.—A very clear exposition of dialysis as applied to photography will be found in our number for January 2, 1874, in an article entitled *What is a Dialyser? and What is its Use in Photography?*

Erratum.—In Canon Beechey's dry-plate formula, given in our last number, the phrase occurs—"beer and pyro. *developer.*" We need scarcely say that for the word "developer" must be read "*preservative.*"

F. C. S.—You cannot have bestowed any *practical* attention upon the Talbotype or waxed-paper processes. Such objections as you urge have no existence whatever, as you will discover after giving either of the processes a single trial.

John B. Smart.—The lenses have evidently become displaced. You must again remove them from their setting and readjust them. The crown glass portion of the back lenses must be next to the sensitive plate, the side of that lens which has most convexity being placed next to the concave, or flint, lens.

Tycho.—Owing to the dark tone of the painting a very long exposure will be required. The most satisfactory mode of proceeding will be to print from the first negative on plain silvered paper, and then have this properly worked up in black and white by an artist. From the print thus finished make the negatives required for printing the necessary supply.

Oxford Amateur.—Gold is precipitated from its solution, in a metallic form, by protosulphate of iron; hence the addition of the ferric salt to your old toning bath ought to give you such gold as there may be present. But with such a small quantity of toning solution as you have, the quantity of gold recovered would certainly not repay the cost and trouble.

C. F. Jones.—The proposed addition to the studio will be an improvement, provided the roof is at present opaque; but if it be glazed—of which no intimation is made, and which we cannot ascertain from the drawing—then no advantage will accrue except that derived from the external slope of the roof, by which the tendency of snow to lodge upon it will be lessened.

J. B. M.—The specimens are good, when the short experience of your son is taken into consideration; but their quality is not sufficiently good to warrant him in taking a situation as operator. He should be placed in the studio of a professional portraitist as assistant operator for a short time. On payment of a small fee many photographers would be found to afford him the opportunity of acquiring experience and a knowledge of the routine of the business.

"Winter" says—"I shall feel obliged if you or any of your numerous readers can advise me as to the best and most economical way of heating the studio and operating-room. Winter is now rapidly approaching, and it behoves one to look to the comfort of one's clients. The method I have heretofore employed—namely, a gas stove—does not at all please me, causing a disagreeable smell and dry feeling. Any advice you can give will greatly oblige."——We say, in reply, that one of George's calorigens, either for coal or gas—but preferably the former—will answer the purpose.

Virtuoso.—The cracks in the black varnish may be filled up by the application of a second coating of varnish. Probably the better way to proceed will be to remove the old varnish entirely, which may be effected by placing the picture in a flat vessel containing benzole, and over which a plate of glass is placed to prevent evaporation. As a rule, the older the varnish is the more insoluble it becomes, the asphaltum of which it is probably composed being acted upon and rendered insoluble by light. After the black varnish has been removed the picture ought to be utilised for the production of the negative. Owing to its great value, we think it a matter of regret that it has not been reproduced.

P. N.—The fluid which you have found at the bottom of Marion's preservative case consists of an aqueous solution of chloride of calcium. It is well known that this salt is exceedingly deliquescent—that is, it absorbs moisture from the air. When made thoroughly dry, and placed in a close vessel along with some *matériel*, such as sensitive paper, the perfect drying of that *matériel* is ensured by the greater affinity of the chloride of calcium for such moisture as may be present. When, owing to accident or design, the calcium chamber of the preservative case is exposed for a protracted period to atmospheric action the calcium, originally hard and dry, becomes liquefied; but by the application of heat the water absorbed from the atmosphere may be again driven off.

Received.—Thomas Grubb; "Mark Oute." In our next.

Photography in India.—The *Athenæum* says that the Prince of Wales's visit to India will give birth to a novelty in the shape of "specials." It is said that Messrs. Bourne and Shepherd, the best known of Indian photographers, will depute the chief of their staff to accompany His Royal Highness throughout his tour through India. This "photo-special" will be assisted by a large number of skilled native photographers, who hope in concert to produce a perfect panorama of the royal progress through Hindustan.

Novel Studio Appliances.—An auctioneer's placard, announcing the sale of a photographer's effects in a town in the North of Scotland, enumerates various articles to be disposed of in the usual way. Among these we find "two peddy stools." Confessing our ignorance of these articles of studio furniture, we should be glad if some friend more familiar with northern accessories would enlighten us upon this matter. To surmise that "pedestals" are meant would be a reflection upon the existing state of northern education in which we will not venture to indulge.

Works of the Late David Cox.—The committee of the Liverpool Art Club have decided to open their new gallery with such an exhibition of the works of the late David Cox as will illustrate his methods of working, be thoroughly representative of all periods of his art, and enable students of art to recognise at once the value and genuine character of the works of this great master of English landscape. The committee ask the aid of all those who possess examples in oil, water-colour, sepia, or black and white, to assist them in making the exhibition reflect the highest genius of David Cox. The committee will pay the expense of packing, carriage, and insurance against fire while upon the premises of the Club.

Photographers' Specimens.—A very considerable trade (says a writer in a daily contemporary) exists in the manufacture of photographers' specimens. You visit a little photographic studio in some of the poorer parts of London, and are attracted by the excellent likenesses hung up at the door. These are seldom or never taken by the men who exhibit them. The Countess of Dudley is a very favourite subject. Her ladyship figures in scores and scores of places where it is morally certain she never set foot in her life, much less honoured the operator with a sitting. These photographs are taken by a firm, whose special business it is, from copies purchased at some first-class studio, and are sold to the poorer photographers for the purpose of exhibiting as I have described.

## METEOROLOGICAL REPORT,

*For the Week ending October* 6, 1875.

Observations taken at 406, Strand, by J. H. Steward, Optician.

These Observations are Taken at 8.30 a.m.

| Sept. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 30 | 30·03 | NW | 50 | 53 | 63 | 50 | Dull |
| October. | | | | | | | |
| 1 | 30·02 | W | 54 | 55 | 63 | 52 | Dull |
| 2 | 29·71 | W | 55 | 56 | 62 | 54 | Dull |
| 4 | 29·71 | W | 58 | 58 | 67 | 52 | Raining |
| 5 | 29·96 | W | 60 | 61 | 70 | 57 | Cloudy |
| 6 | 30·42 | W | 46 | 49 | — | 47 | Dull |

CONTENTS.

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 806. Vol. XXII.—OCTOBER 15, 1875.

## A NEW RECIPROCATORY BURNISHER.

When in the Orkney Isles, in June last, we saw, and described in our number for July 2, an appliance of a mechanical character by which the burnishing of prints was effected in a very easy manner by the application of a treadle and fly-wheel. This gave two advantages to the operator to whom was delegated the task of burnishing the prints—first, it ensured that continuous motion to the feed-roller of the burnisher which, by previous trial ofttimes repeated, we had found to be essentially necessary when uniformity of the surface finish was desired. The stoppage of the feed-roller for only a second acted in a manner similar to the stoppage of a plate for the same period of time during its downward passage into the silver bath—a mark was produced which was effaced only with the greatest difficulty. It also gave a further advantage—both hands of the operator were left at liberty, owing to the roller being rotated by the foot. So much were we struck by the efficiency of the method adopted by the Orkney photographer referred to—Mr. Russell, of Kirkwall—that we expressed a hope that manufacturers and dealers would turn their attention to improving our burnishers by the addition of suitable mechanism to effect the purpose then pointed out. Print-burnishing is now being carried out very extensively, and anything done to render its practice easier will be hailed with interest.

Incited by our observations on the occasion to which reference has been made, Mr. W. Cleary, of Bolton, has, without bringing the foot into service, done all otherwise that can be done by manual aid; for he has interposed a wheel and pinion between the handle and the roller, by means of which a very steady motion is imparted, coupled with a heavy pressure, this pressure being given without any strain upon the muscles of the arm. When the pinion becomes the driver of the wheel into which it is geared the power thus obtained is very great, and of this well-known principle in mechanics Mr. Cleary has taken the fullest advantage; hence a small amount of power exerted upon the handle is multiplied five to six times. There is, as we have previously said, no gain without a loss. The gain in power here obtained is at the loss of speed. But in this case, so far is the diminution of speed from being a loss, it is really an advantage; for, as we have demonstrated in former articles, the slow passage of a photograph over a heated burnisher is much more effective in producing a high gloss than a quick passage over the polished steel. The multiplying gear here described affords a capital opportunity of attaching foot mechanism of a light kind, to be used in those cases where it may be thought desirable; for, whereas in the Kirkwall machine the pulley was fixed upon the axis of the roller, in this case it would be fixed upon that of the pinion by which the roller is driven, and hence the fly-wheel and treadle of the lightest sewing-machine would suffice to perform the functions of a driver.

But a point, if not *the* point, to which Mr. Cleary attaches special importance in his "New Patent Reciprocatory Burnisher"—for a patent has been obtained for certain novel features introduced into his burnisher—consists in the way in which the burnishing bar is placed in the apparatus and is made to move in the reciprocating manner considered by many to be essential to effective burnishing.

The burnisher consists of a straight, square bar of steel, which lies in a longitudinal recess immediately underneath the feed-roller. This recess is stationary, but the steel bar is so fitted as to slide freely inside of it. On each end of the roller is a circular cam, the inner faces of which are bevelled, and against which each end of the steel bar presses. When the roller revolves the wedge-like face of one of the end cams, by pressing against the end of the burnishing bar, forces it away as far as it has power to do so; and at this stage it would remain stationary but for the cam at the other end, which now comes into action, and during the next semi-revolution of the roller, on the axis of which the cams or eccentrically-faced end-pieces are fixed, repeats in an opposite direction the pushing action of the cam at the other end. So long, therefore, as these cams are in their places it is impossible to rotate the feed-roller without causing them to perform a reciprocatory movement.

From what we have said it will be seen that, if it be desirous to try the comparative merits of the reciprocating or oscillating motion of the burnisher against that of the simple or stationary position, all that has to be done is to remove the eccentric cam or cap from one end of the roller, when the to-and-fro motion of the burnishing bar immediately terminates. By means of two milled-headed screws the roller is adjusted to suit the thickness of any card, two extra milled-headed screws serving to fix that distance, so that by no amount of working is the roller allowed either to recede from or approach to the face of the burnisher unless when so required.

It only remains to be said that an atmospheric gas burner is attached permanently to the burnisher, which is also provided with a spirit-lamp to suit the exigencies of those who have not gas at hand. That the burnisher now described will answer the intended purpose in an effective manner it is unnecessary to remark. We have said that it has been patented; but, as we have not yet examined the completed specification, we are not in a position to indicate with certainty the special features claimed by Mr. Cleary. This we shall do at a future period.

## WINTER EMPLOYMENT FOR AMATEURS.

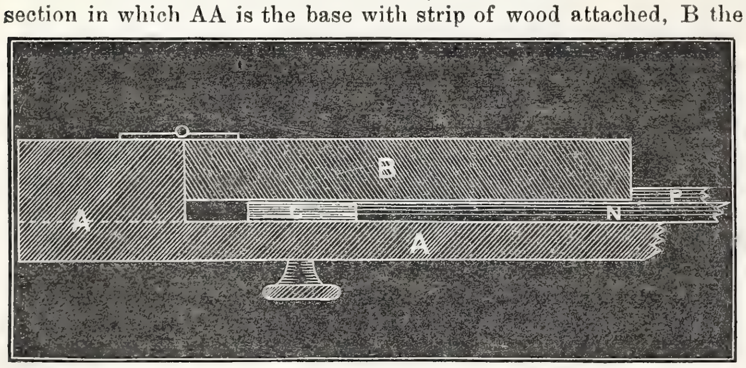
In continuation of our remarks of last week it is our intention in the present article to consider the various manipulations and also the special apparatus necessary for obtaining the best results in connection with the production of glass transparencies. As regards the apparatus—if such, indeed, it can really be called—it is of so simple a nature as to be within the power of construction of even the veriest tyro in mechanical operations, though, at the same time, there is no reason why those who possess the requisite skill should not exercise it in the manufacture of appliances of an elegant as well as serviceable description.

In the earlier days of stereoscopic photography, when the negatives were almost invariably taken upon the old stereo. size of plate, viz., $6\frac{3}{4} \times 3\frac{1}{4}$ inches, all that was necessary for printing transparencies by superposition was a plain deal board about eleven or twelve inches long by about five in width, with a square aperture of the necessary size in the centre, and a strip of wood fixed upon one

edge as a guide. When the Latimer Clark form of camera was employed even this was unnecessary—the two halves of the negative being already reversed might be printed in an ordinary printing-frame. Some operators at the present time prefer to cut the negatives and reverse the halves, cementing them in proper position upon another glass by means of glue or Canada balsam; while others, again, fear to expose a valuable negative to such a risk.

With the larger-sized plates now almost universally employed for stereoscopic negatives a slightly more complicated printing-frame is necessary in order to enable the operator to select his subject from any portion of the plate. Thus, in the case of a stereoscopic negative upon an 8 × 5 plate, a portion only (measuring at most 3 × 3) of each half is required, and it is obvious that with some negatives part of the foreground may be omitted, while with others it may be preferable to leave out more of the sky. To render this possible it becomes necessary to make arrangements for the motion, both horizontally and vertically, of the negative, so as to bring any desired portion of it opposite to the aperture, at the same time that its base line is kept parallel with the edge of the aperture, while the guide against which the sensitive plate rests must always occupy the same position.

The simplest way of effecting this is to procure a board about fifteen inches by ten and about three-eighths of an inch thick. Along one of the longer sides glue a strip of wood about half-an-inch thick by one inch broad; to this must be hinged a second strip two and a-half inches wide and about one-eighth thinner than the former one, or so much thinner that it will, when shut down, allow the negative to lie underneath it. This forms the guide for the sensitive plate. The guide for the negative is formed of a thin strip of hard wood working in a couple of slots on the base-board, under the flap, and so arranged as to be capable of movement in a direction to or from the hinges or opposite edge of the guide, and of being fixed in position by means of set screws working through the slots. The description will be better understood by a reference to the annexed section in which AA is the base with strip of wood attached, B the




hinged flap or guide for sensitive plate, C the movable guide for the negative with set screws attached, while N and P show respectively the positions of the negative and prepared plate when in use. The flap B should reach to one-eighth of an inch from the edge of the aperture, which, if the latter be three inches square, will leave a margin of an eighth of an inch at the top and bottom of the picture. If the aperture be smaller than three inches the distance must be increased in proportion. The movable guide C must be capable of movement from the hinge to the outer edge of B, when, if the proportions given above be adhered to, it will be found possible to bring any portion of an 8 × 5 or smaller negative into position in front of the aperture.

The method of using this frame is very simple. Having selected the negative and decided which portion is to be printed, fix the sliding guide C at such a distance from the aperture that the required portion is just included. Clamp the guide in position by means of the set screws, taking care that it is parallel with the edge of the opening, and, having made a mark with a pencil or otherwise to show the exact position of the negative, slide it along the guide until precisely the same amount of subject from the other half is brought opposite the aperture. The hinged portion B (which we omitted to say should be covered with velvet or soft cloth on the under side) is now shut down upon the negative and keeps it in position. The first half of the transparency is now printed by carefully laying down the prepared plate upon the negative in such a manner that the left-hand half of the plate receives the impression of the right-hand half of the negative. The picture is exposed for the necessary time to gas or other artifical light, the plate carefully removed, and the negative pushed along the guide until it occupies the proper position as previously marked, when the operation of printing is repeated. By having a couple of fixed marks upon the edge of B against which to place the end of the plate when printing perfect uniformity as regards margin may be secured with the greatest ease.

A word or two as to the width of the margin and the size of the picture. Theoretically, it is incorrect to make the picture broader than the distance between the eyes, usually taken as two and three-quarter inches, or, more correctly speaking, to have the centres more than that distance apart; and in practice many persons find it impossible or inconvenient to utilise pictures exceeding that size. There is, of course, no necessity to limit the vertical dimensions of the picture beyond the degree necessary in the interests of neatness in order to leave a slight margin. Any margin in excess of one-eighth of an inch above and below the picture detracts, in our opinion, from the general effect; hence we fix the vertical measurement at three inches. In most cases it is desirable to have the vertical and horizontal diameters equal, a more symmetrical appearance being thus secured. In order to effect this without having the centres of the two pictures so far apart as to cause inconvenience to the eyes it is necessary to resort to a little "dodge," which, though perhaps scarcely correct in theory, presents no practical objections to its use. It consists in including a small portion of the subject in each half of the picture which does not exist in the other. By this means it is easy to have the pictures three inches in diameter while the actual centres are only two and three-quarters.

The next point for consideration is the light, which need give very little trouble. Sunlight, from its great power, is inadmissible; and even diffused daylight must be used with very great caution and in small quantity. But the best means of illumination consists of an ordinary gas or paraffine flame, whichever may happen to be the more convenient, each possessing the necessary amount of actinism and being sufficiently constant in intensity. In using the paraffine lamp, however, precaution must be observed in keeping the chimney scrupulously clean, or the deposit of smoke, though perhaps scarcely visible to the eye, will cause great irregularity in the strength of the light. Another matter to be observed is the maintenance of an uniform distance between the frame and the source of light during exposure, as, at the short distance which usually exists between them, the slightest variation produces a difference in the intensity of illumination.

We prefer to make the exposure at a greater distance from the light than is usually observed, because it tends in the case of uneven or lumpy glass to give a sharp image where the contact between the two surfaces is not perfect; it also lessens the refraction which the light suffers in passing through the glass, and which is principally noticeable at the edges of the picture, giving a confused and hazy outline. To secure this uniformity we use a light framework, consisting of a flat base from which rise two uprights, against which the transparency frame is rested during exposure. By placing this arrangement always at a given distance—say eighteen inches—from the source of light a very near approach is made to entire uniformity of exposure.

In considering the preparation of the plates the first question of importance is the glass. It is usual to employ a very thin sample in order to avoid the unwieldiness consequent upon cementing together two plates of the ordinary negative thickness. The best glass for the purpose, but which is not always to be had, is known by the name of "French plate." It may be obtained of such a thickness that two sheets of it scarcely measure as much as an ordinary negative plate. This glass requires very great care in cleaning and polishing, especially the latter; hence we prefer in all cases to use a substratum in order to obtain a chemically-clean surface with the minimum risk of breakage. Either india-rubber or albumen may be employed, or a third mixture, which will be described later.

No special directions are necessary for the preparation of the plates beyond what we said last week in speaking of the emulsions, unless it be in connection with the drying of the gelatine plates. In using the latter emulsion the glass, previously cleaned and dusted, should be warmed slightly, and the gelatine poured carefully on so as to avoid air-bubbles, and "led" over the plate by means of a strip of glass or paper, any bubbles or defects which may accidentally appear being removed in the same manner. The surplus is returned to the bottle, being poured down the side so as to avoid bubbles; but the plate must not be drained so closely as is necessary with collodion. A little practice will enable the operator to judge how much to leave on the plate, which is then placed in a perfectly horizontal position until cold, when the gelatine will become firm.

Many convenient forms of levelling-stand have been recommended, perhaps the most convenient being a narrow board suspended by the corners in as nearly as possible a level position. The plates, when coated, are placed upon this shelf until "set," when they may be reared up in a drying closet until thoroughly desiccated. A rough but effective drying-chamber may be constructed as follows:—Take an ordinary packing-case of suitable size and fix in the centre an open rack to hold the plates. At the *top* of one side and the *bottom* of the opposite one cut an aperture about three or four inches deep and extending the whole length of the box. Cover these apertures with two thicknesses of window muslin to keep out dust, and the affair is complete.

To use the drying-chamber place it on the floor of the preparing-room with one of the gauze-covered apertures against the fireplace. Cover up the front of the grate by tacking brown paper or other suitable substance round the sides of the box and over the open fire-place, so that the draught from the room must proceed through the box before entering the chimney. Gelatine plates placed in an arrangement of this description are ready for use in three or four hours after preparation.

The plates being prepared, whether by gelatine or collodion emulsion, the next question is the exposure. The general rule with regard to this is to give as long an exposure as can be possibly done without rendering the shadows weak and flat. The *best* exposure for any particular negative can only be decided upon by direct experiment; but with plates prepared from the emulsions we have described very little trouble need be experienced. The development should be as rapid as possible, a three-grain solution of pyro. made strongly alkaline, and, at the same time, well restrained with bromide, being the best, though some operators prefer to bring out the picture with the smallest quantity possible of alkaline and to intensify subsequently.

The extent to which the latter operation is to be carried depends upon the purpose for which the transparency is intended; if for the lantern all that is required is a clear, soft picture with little density and the high lights represented by clean glass. For stereo. and decorative purposes greater density is needful; but in these cases the eye is capable of judging when the proper effect is attained.

Here also we must study *colour* if a pleasing effect be desired, and it is frequently necessary to resort to a special toning process in order to give the best appearance to the print. For this purpose there are many plans recommended, the oldest of which is, perhaps, the mercury process. Of this, however, we should decidedly advise our readers to fight shy; for, however pleasing may be the original tones obtained, the result is at best deceptive, and sooner or later the whole picture fades or becomes covered with unsightly patches and spots. Gold gives very good tones if its action be not continued too long, but it is inclined to give too cold a tone.

The best toning agent of which we are aware is perhaps the chloride of copper, applied as we directed in our article of June 11 of the present volume. We may here recapitulate the directions then given. After fixing and well washing the plate it is treated with a strong solution of commercial chloride of copper, the exact strength being immaterial. The action is continued until the whole of the image is converted into chloride of silver, when it is washed thoroughly, and without any further exposure to light is again treated with the alkaline developer. If a black tone be desired a weakly-alkaline solution well restrained with bromide will produce the best result, while a strong and unrestrained mixture will produce a warm tone; any intermediate effect may be produced at pleasure.

Very pleasing effects of colour may be obtained by varying the nature of the organifier, tannin and gallic acid combined in different proportions giving any shade between warm brown and blue-black, while quinine or its sulphate gives a cool, neutral black.

For the benefit of those of our readers who may prefer to work the wet process we shall, next week, have a few words to say on that branch of photographic work, and shall, at the same time, describe a very convenient camera for the purpose in view. The mounting and finishing of the transparencies will also be fully treated.

## ON COLLODION SUITABLE FOR DRY PROCESSES.

We think the article on the above subject, written by Mr. Hardwich fifteen years ago, and reproduced in our number for last week, is worth more than a passing notice; and we therefore take this opportunity of specially directing the attention of our readers to that communication. With this object in view we devoted a portion of the past week to a series of experiments, which, while fully corroborating the opinions formed by Mr. Hardwich as to the part played by potash when added to a tough collodion, may encourage those who have hitherto found a difficulty in making or obtaining a suitable pyroxyline to give his recommendation a trial, and we have no doubt they will find it thoroughly successful.

In the early days of the collodion process, when nearly every photographer made his own pyroxyline, we were not accustomed to hearing many complaints as to the quality of the collodion produced. This arose, no doubt, partly because of ignorance as to the influence which the pyroxyline really played in the production, or, rather, in the modification, of the image, and partly to the fact that people generally are more easily pleased with their own than with the productions of others. Even for a considerable time after the manufacture of collodion had become a commercial industry rather than an amateur production, the complaints as to its quality were comparatively few, arising, probably, from the fact that there were many makers in the field, and that, as their productions varied considerably, if the collodion of one did not work well that of another probably would. Now, however, that the manufacture is confined to a few, there can be little doubt that for a considerable period much of the ordinary commercial collodion has been of too tough and horny a nature—at least for some purposes. In all likelihood this proceeds from the fact that the pyroxyline which yields that particular collodion is more easily and cheaply made than one which is more porous; and as it seems to be found quite as suitable—if not a little more suitable—for wet collodion, its manufacture is likely to be continued. But although a tough, close-textured film is perfectly suitable for collodion to be exposed and developed while wet, it is not so in the case of a film that has been allowed to become dry. It would seem that such a collodion after once assuming the horny condition does not become porous on being made wet, and that porosity is not retained, as was at one time generally supposed, by any of the preservatives in general use. The result of this is that the developer fails to penetrate the film as it should do, and the image is superficial in character and grey and unsatisfactory in tone.

But as Mr. Hardwich has shown, and as has been frequently noticed, there is more than a mechanical influence exerted between the film and the salts with which it is brought in contact. There is, undoubtedly, a considerable amount of chemical action, by which the resulting image is very much modified both in appearance and quality. We have never found any difficulty in producing a pyroxyline in every way suitable for most of the dry processes at present in use, by mixing three parts of sulphuric acid (s. g. 1·85) with one part of nitric acid (s. g. 1·45), raising the temperature to 170° F., and adding sufficient water to almost, but not quite, reach the point at which the cotton would dissolve in the mixture. Well-cleaned and thoroughly-dried cotton steeped in this mixture for ten minutes, and then washed and dried, is generally supposed to have undergone a more complex change than the mere conversion into pyroxyline;

and probably some of the cellulose has been changed into glucose. Whatever it may be, it certainly combines in some way with the silver salts, and gives an image of a totally different character from that produced with pyroxyline made with less water and at a lower temperature, while its porosity is instantly regained when moistened, and development proceeds evenly and rapidly.

Although, however, a suitable dry-plate collodion may certainly thus be made, we are aware that there are many who have neither the convenience nor the inclination to make their own pyroxyline, and to such the recommendation of Mr. Hardwich to use potash is of the utmost value. We are aware that there is a general aversion to add anything to the collodion that tends in any way to put the bath out of order, and we had some doubt as to whether the potash, even in the small quantity recommended, might not have some injurious effect; but, after a rather prolonged series of experiments, we think we are warranted in saying that the danger is only imaginary.

The potash we used was simply the *potassa fusa* of the shops, having the formula K H O; and as it was completely soluble in alcohol, and did not effervesce with acids, we considered it pure enough for our purpose. We made an alcoholic solution of the strength of five per cent., so that each twenty drops contained one grain. The experiments were made with some very tough, plain collodion of our own make and several samples of the ordinary commercial article. To these were added various proportions of the K H O, from a quarter up to a grain to each ounce. At the expiration of twelve hours all the samples were found quite fluid, and when poured on glass and allowed to set they had, when rubbed with the finger, a soapy feel, and when the finger was pushed across the plate the edges presented the clean cut so characteristic of suitable dry collodion. A number of samples of bromo-iodised collodion were treated in the same way and with similar physical results. The plain collodions were iodised, and the whole allowed to stand for two days, after which their suitability for wet collodion work was fairly tested alongside of the samples to which potash had not been added. The result was that the alkaline collodion, while perfectly clean, developed more rapidly to full printing density, and gave an image of a peculiar reddish-brown colour, something like a pyrogallic-acid-developed negative, and the film bore any ordinary amount of washing without showing signs of weakness. So far we were satisfied that the potash did not injuriously affect the collodion for wet work, and we then proceeded to see what it would do for dry plates.

We intended to use a binocular camera, and so we marked one end of each plate, and coated one half with collodion to which the alkali had been added, and the other half with that to which it had not. Some of the plates were preserved with beer, some with coffee, and some with tannin, and all had the usual albumen substratum. They were exposed in the morning, each set of plates receiving the amount of exposure we considered necessary, but each half, of course, getting the same. They were developed in the evening in the usual way—first with alkaline pyro., and then with acid pyro. and silver; and here the influence of the potash was very marked. In the first place, the half of the plate on which it had not been applied was most difficult to get evenly moistened, requiring a stream of water from the tap for nearly a minute before it was free from a greasy appearance, while the other half as soon as wet was perfectly smooth. When the alkaline pyro. was applied the one half instantly showed an image which was fully out long before there was more than a trace on the other, and under the acid pyro. and silver it rapidly acquired printing density. We do not think the alkaline collodion is really more sensitive than that containing no potash, as by persevering with the developer an equal amount of intensity was in most cases obtained; but it can certainly be fully developed in less than a quarter of the time.

After all the plates had been fixed and dried an examination was made as to their physical appearance, and the result was very decidedly in favour of the alkaline halves, the colour being in all cases very different. The neutral collodion image was thin and greyish, quite visible on the film side, but not much so when examined by reflected light through the glass, while the alkaline image was more or less approaching to a cinnamon brown, and equally visible on both sides of the plate. The one image, in fact, seemed to be almost entirely on the surface, while the other was through the whole body of the film.

In the course of these experiments we noticed that some samples of collodion required more of the potash than others to produce the full effect; but, as Mr. Hardwich has pointed out, an excess of the alkali may at once be detected by the addition of a little silver—preferably an alcoholic solution—which throws down a grey powder (the oxide), while if the alkali be not in excess the precipitate will be white. Of course when the alkali is in excess a little more of the collodion will make matters right.

The result of these experiments warrants us in saying that in caustic potash photographers have the means of converting any good ordinary collodion into one in every way suitable for most dry-plate work, and that in this matter Mr. Hardwich has added one more to the many obligations under which they already lie.

Whether ordinary collodion treated in this way will be found equally well suited for emulsion work we are not yet prepared to say; but we shall continue our experiments in that direction, and inform our readers of the result.

## THE PHOTOGRAPHIC EXHIBITION.

[Third Notice.]

The works exhibited by Messrs. Spencer, Sawyer, Bird and Co. are numerous, very large in dimensions, highly attractive, and most decidedly educational. Having on previous occasions demonstrated the capabilities of the carbon process when applied to enlarged portraits, this enterprising firm appear to have decided upon doing the same for landscapes this year—not, of course, to the entire exclusion of portraits, of which they exhibit many fine examples. One thing we notice with pleasure: on the labels affixed to the carbon works of this firm we find a distinct intimation of the name of the artist from whose negative the enlargement was produced. Out of the large and singularly excellent collection of works in autotype we find it somewhat difficult to indicate any for special notice; we may, however, direct attention to a fine conservatory scene from a negative by J. Thomson (213); to a very charming forest scene from a negative by Marsh Brothers (221); to an exquisite portrait from a negative by Liebert, of Paris (161); equally excellent portraits from negatives by Greaves (221) and by Hermit, of Paris (179); and to an enlargement from a negative by Sawyer and Bird, of Norwich (187). All these, and many others exhibited by Messrs. Spencer, Sawyer, Bird and Co., are enlargements in carbon, and to several of the works the pleasing intimation "without retouching" is affixed.

There is a choice series of pictures exhibited by Mr. Stephen Thompson, entitled *Old English Homes*, and which are not confined to one portion of the room. There is an air of quiet refinement about these views which cannot fail to be attractive. The majority of the *Homes* are interior views, among which we specially point attention to *The Picture Gallery at Penshurst* (43). Of the landscapes exhibited by Mr. Thompson we may notice *A Beechen Slope in Knole* (52), and *After the Storm* (86), as being charming examples of photographic art. The last-named picture represents a rare old forrest tree which has succumbed to the overpowering force of a recent hurricane.

Mr. J. E. Mayall exhibits three portraits (enlarged) of great excellence. Of these the portrait of E. J. Reed, M.P. (38), is life size. A beautiful portrait of Madame Patti (113) has been finished in the style for some years associated with the name of Mr. Ferranti, the background being matt.

Those who are interested—and who are not?—in the various rival modes of finishing, or working upon, enlargements have in two pictures, by Mr. George Croughton (44 and 46), a capital opportunity afforded of studying the works of at least two representative artists, for those of Mr. Croughton are hanging in immediate proximity to works by M. Lambert, and which are of a similar character. We have already referred to the latter; of the specimens by Mr. Croughton, which are termed "mezzotint enlargements," we must express great admiration as to the care and skill displayed by this artist.

The eye dwells with unmistakable satisfaction upon the series of views in Scotland exhibited by Mr. G. W. Wilson. Always in the fore-rank, his contributions this year show that he is in no danger whatever of being displaced from the honoured position he has so long occupied. In the frame numbered 42 are to be found similar views in the Trossachs and Loch Katrine, which, for transparency in the shadows, purity in the lights, and general pictorial excellence, cannot possibly be surpassed with our present appliances. Mr. Wilson also exhibits views taken in Edinburgh, Melrose, and Elgin, (167), which we commend as studies to the connoisseur.

Two fine enlarged carbon portraits, respectively *Miss Rose Hersee* (26) and *Carl Rosa* (37)—names at present somewhat famous in the musical world—are exhibited by Messrs. Robinson and Thompson. In a frame of views in Devonshire (57), by Mr. T. S. Catford, there are some attractive marine studies, while "bits" in the vicinity of Brighton (55) have been ably depicted by Mr. E. Fox.

Several admirable studies of deer (enlargements) are contributed by Captain Horatio Ross. Mr. England also contributes largely, his exhibits being confined to copies of paintings and sculpture. The latter will amply repay the most careful study, so skilfully has the lighting and general treatment been managed.

In a very large collection of cabinet landscapes, by Mr. Mawdsley, no observer can avoid being impressed with the soft, porcelain-like effect obtained. The admirable gradations of distance displayed in this gentleman's various specimens attest unmistakably the capabilities of the emulsion process by which they were produced.

The great pressure on our pages this week prevent our giving a more extended notice in the current number.

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We have received several communications on the subject introduced by Mr. Werge respecting the recent *conversazione* of the Photographic Society, and have been rather amused at some of the opinions expressed by two of the writers, who assume that operators and printers have a right to be present at the private view or *conversazione* because they assisted in producing the pictures. We say "amused" because it brings the following suggestion irresistibly to our mind:—Suppose any of our eminent opticians or manufacturers of philosophical instruments send a new object-glass, spectroscope, or other piece of apparatus to be exhibited at the *soirées* of the Royal Society or the Royal Microscopical Society (which by the way they almost invariably do), have all their *employés* the right to attend the *soirée* and demand that evening dress should not be *de rigueur* because they do not possess a dress coat? A matter of this kind may be very safely left in the hands of the President and Council of the Photographic Society. From this it will be seen that we do not entertain a strong sympathy with Mr. Werge's proposal.

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## THE COLLODIO-ALBUMEN PROCESS.

The article on *Defects in the Collodio-Albumen Process*, in last week's issue, contains two propositions from which, with all deference to editorial infallibility, experience has taught me widely to differ.

The first of these is—that whilst the preparation of plates in the first stage with a simply-iodised collodion may be conducted not only in broad daylight but in the brightest sunshine, such a plan cannot be adopted with impunity when a bromo-iodised collodion is used.

In my own practice I invariably conduct the preparation of collodio-albumen plates through both first and second stages in a dark room, believing that greater softness in the resulting negative from plates so prepared is obtained. I have, however, in several instances, in making plates for my own use, prepared them in the first stage, and with a strongly-bromo-iodised collodion, in a room through the window of which bright sunshine has flooded them for several hours at a time.

I enclose two or three prints from plates so prepared and their behaviour as regards fogging was in every case exactly the antithesis of what is said. I find them rather more backward under development than plates prepared throughout in a dark room; but they have had a remarkable freedom from fog, and a slight tendency to hardness, which, however, was easily overcome by using the pyro. strongly alkaline. In the accompanying prints, although the exposures were short and the development very much forced by alkaline pyro., the division between the right and left pictures made by the camera partition is all but absolutely bare glass.

Theoretically, a simply-iodised collodion ought to be the best to form what you rightly designate the "cushion" on which to receive the superstratum of bromo-iodised albumen; but during a considerable practice, extending over many years, I have failed to prove any advantage in favour of either one or the other. I therefore conclude that, although the presence of a bromide is of the highest importance in the wet process where a collodionised plate is simply excited and developed, without any intermediate treatment except exposure in the camera, it is in the collodio-albumen process rendered inert—partly by the subsequent washing and treatment of the film, and partly by its being in company with a superior force of iodide.

With respect to the second proposition, namely, that after the final sensitising in the aceto-nitrate bath "a bath of iodide of potassium may be advantageously substituted for that of chloride of sodium," there is nothing whatever to recommend it except the very unsatisfactory experience of Mr. W. H. Price, that plates so prepared "showed a lamentable lack of sensitiveness." This is not to be wondered at, for what is the effect of such treatment except to convert what free nitrate of silver there may be in the film into iodide of silver, which, for all practical purposes, is insensitive to light. A plate so treated may be taken out into broad daylight and afterwards, when re-dipped in the aceto-nitrate bath and exposed in the camera, will produce a picture as if it had not seen daylight.

It is quite true that, with dogged perseverence, an apology for an image may sometimes, and under certain circumstances, be forced out on a film of iodide of silver. I have before me two stereoscopic plates the half of each having been dipped in a bath of iodide of potassium after having been in the aceto-nitrate bath. One of these plates was exposed under a negative to bright diffused daylight for three minutes, and afterwards developed in the usual way. The half of the plate which had not been treated with iodide came out a vigorous and over-exposed transparency, and the other half with the same development showed, when finished, a faint image of the picture, just discernible by reflected light, and having no vigour by transmitted light. The other plate was exposed in the camera with a pair of steroscopic view lenses acting equally on both halves of the plate. The result of this trial, however, was that although a long exposure was given, yet with the feebler image formed by transmission through a lens no effect whatever had been produced on the iodised side of the plate, which, when fixed, showed only as clear glass, the other half with the same treatment being a fully-exposed negative. The desensitising action of the iodide bath in my experiments was an immediate effect, and I do not think, if the plate be allowed to remain in the bath a sufficient time—say four or five minutes—that any further action will go on afterwards.

That the effect of an iodide bath after the final sensitising is to enrich the film I do not deny; but if such enrichment is to be obtained by the loss of sensitiveness where is the advantage?

J. Pollitt.

[Mr. Pollitt has probably read our article rather hurriedly, our second proposition being *exactly the reverse* of what he has stated it to be. So far from advocating the employment of a bath of iodide of potassium, we said, in effect, that while such a course had been recommended by some, yet that Mr. Price had found that plates prepared in that manner "showed a lamentable lack of sensitiveness," and hence that he had condemned a number of plates thus treated. We are not sorry, however, that Mr. Pollitt has misapprehended our remarks, inasmuch as by his doing so we have been favoured with his experience in this direction—an experience further valuable because it affords confirmation of Mr. Price's experiments. With respect to the action of light upon bromide of silver as compared with the iodide—we refer now to the *visible* effect of the light—there is no doubt that bromide is very sensibly and very rapidly affected by light, which fact is well recognised by collodio-bromide workers. Mr. Hardwich, writing upon this subject many years ago, says that "bromide of silver on exposure to light becomes of a grey colour; iodide of silver does not alter in appearance by exposure even to the sun's rays, but retains its yellow tint unchanged." But, after all, it is to successful *practice* we must look rather than to nice theoretical considerations, which may be so modified in this application as to be almost inert. The prints enclosed by Mr. Pollitt are, undoubtedly, bold and brilliant.—Eds.]

## PHOTOGRAPHIC ETCHING ON GLASS.

[A communication to the Edinburgh Photographic Society.]

This was the subject of a paragraph, and not a short one, in the columns of the *Scotsman* a few weeks ago, in which paragraph certain claims are made which require examination:—

"Etching on Glass.—We have just had an opportunity of inspecting some views of old Edinburgh produced by Messrs. J. Malloch and Co., Lawnmarket, by means of a method of etching on glass which that firm may, we believe, claim the credit of contriving. The object of this simple but ingenious process is to provide the draughtsman with a surface which shall at once admit of the utmost freedom of hand, and receive and retain the slightest and sharpest touches of the etching point. A sheet of perfectly-smooth plate glass is covered with a preparation which, when dried, has all the appearance of a coat of yellowish oil paint, only that it possesses considerable translucency. The pigment seems to adhere firmly to the glass, but, at the same time, is capable of being easily removed by a needle point, so as to leave the glass exposed in perfectly clean-cut lines. Working on the surface much as he would do on the wax coating of the copper plate—but with the additional advantage that he can readily judge of the effect of his touches by ever and anon placing the glass against a dark background—the etcher makes his drawing. This having been completed, a process of photolithography is resorted to for the purpose of reproducing it on paper, and from specimens before us we can testify to the transference being effected with remarkable sharpness and precision. The prints, in fact, might very easily be mistaken for impressions of etching on copper, reproducing, as they do, with the utmost clearness of definition every line and dot of the original drawing. The advantage to artists of such a medium as the pigment-covered glass seems too obvious to call for remark. Without the necessity of mastering a difficult technical process he has here the means of expressing himself with perfect ease and freedom, and that, too, it would seem, with the certainty of his work being reproduced in exact duplicate. The method seems also well worthy of the attention of amateur draughtsmen who may not care to face the practical difficulties of copperplate etching or wood engraving."

You will see from this that the claim is made by the writer for Messrs. Malloch and Co. of inventing or contriving the method of etching on glass, which is expressly brought forward as new. Now, the narrative of the facts in the case is something like the following:—

Our esteemed fellow-member, Mr. Norman Macbeth, A.R.S.A., brought before this Society a method different in detail, but not in practice, from that which had been in use for many years and by different persons (originated I know not how, but never put to such use), of etching or drawing with a fine point on a film of collodion and intensified with silver till it had become quite opaque and black when looked through. Afterwards, by etching through this ground, and having a white surface below, the artist was enabled to produce, by the use of an etching-needle or a hard steel pen or other instrument, an etching on the plate, which was in this way transformed into a negative or plate similar to a copper or steel plate, but capable of being printed from as a photograph.

One of the drawbacks in the process was the dark colour of the etching ground, which prevented the progress of the work being easily seen. On this being made known I suggested that it would be possible to work with a white ground by taking an ordinary dry plate prepared with a substratum of albumen without the after-addition of exposure to light and intensification with silver. After the etching had been completed on the iodised dry plate it was then to be treated with Schlippe's salt in a weak solution, which at once would convert the etching into a strong printing negative fit for any purpose. After a few trials perfect examples were obtained, and exhibited before this Society by Mr. Macbeth and by myself.

I should state that one of the gentlemen mentioned in the paragraph was present at these meetings, and at them showed some very rude sketches with the point on smoked glass, believing he had in that made a great discovery; and when informed that Dr. Strethill Wright had made many of his most perfect microscopic drawings in this way he seemed not only much annoyed, but actually to doubt or misbelieve his informants, although these drawings, as lantern slides, had been shown to this and other societies long before, several of them—the *Volvox globator* and others—being of the highest order of merit. Such being the case I cannot allow this claim to be made without entering my protest against it.

It may be said that in all that has been advanced nothing has been said of photolithography; but this is precisely one of the applications to which the idea or method when published was stated to be applicable. Everyone who has experimented in that direction knows—and it has been stated here, and published from here, probably as early as from any other source—that the *sine quâ non* of a good photolithographic negative was absolute clearness of the transparent parts, with the nearest approach to absolute opacity in the darks, which, when reversed on the lithographic stone, gives pure blacks and whites. The method of etching or drawing on a dried plate gives this in the highest degree, and so makes the negative best fitted for photolithography.

The necessary work of making transfers and putting to press, being only part of many previously-published methods of doing this—more especially after the works of Ramage, Osborne, Sir Henry James, and others of a dozen years ago, and the explicit formulæ which have been published in such profusion, not to mention the practical exemplification of the whole art which I brought before the Society in this very room a dozen years ago at least—are not such as anyone can now claim, or allow to be claimed for them, without, at least, allowing for the credit due to those who have gone before.

I do not wish to determine who first etched on a dried collodion plate; but I can state that Mr. Charles Edward Johnson, now of London, etched a sketch of an old seventy-four war-ship in my presence, while he was a resident in this city, more than twelve years ago, and where he has not resided since.

Whoever was the originator of etching on glass, I know it was not the persons named in the paragraph I have quoted. At the same time I have no doubt that the perfecting and bringing this little method before the public is due to either Mr. Norman Macbeth or his equally clever son, Mr. Robert Macbeth, specimens of whose work, as exhibited first to this Society, I now again show after an interval of some years.

One more word and I have done. Artists have singularly neglected this admirable method of transmitting their thoughts and ideas to others. If Messrs. Malloch and Co. will be content with the credit of again calling attention to this really cheap, facile, and handy mode of reproducing the direct work of the artist's hand the penny-a-liner's work will not have been misplaced; but if they allow the invention or inception or conception of the idea to be attributed to them, then we must adopt this or some stronger method of stating that such is not a fact.

With one more suggestion I close my communication. Schlippe's salt is for this purpose useful enough, especially if used weak and newly made up, or reduced sufficiently with water; but a much more effectual intensifier is to be found in a solution of tannin used in this way, or these ways:—Either prepare the plate as for a dry plate, and do not wash away the adherent silver completely, but leave just sufficient to become coloured by the application of the tannin, and, after the etchings are complete, wet thoroughly, and give a wash with a six-grain solution of tannin and wash; or take this other method:—After washing thoroughly, then drying, then etching, then wetting again, then flowing over with a twelve-grain solution of silver and soaking the film, then washing slightly and treating with the above solution of tannin, and you have a negative unsurpassed for opacity in the darks and clearness in the lights. W. H. Davies.

## REV. T. F. HARDWICH.

With the rise and earlier progress of every art, science, or industry there are always associated the names of those who guided its infantile steps and tended it while in leading-strings. In this respect photography forms no exception to the general rule. To the talent, skill, and persevering industry of those earnest men who clustered around our art-science shortly after its advent is owing, most unmistakably, the high and advanced position photography has attained even while it is yet in a state of juvenescence. Prominent among those who are so honourably associated with the early history of practical photography is that of the gentleman whose name stands at the head of this article. Before speaking in detail of Mr. Hardwich's photographic labours we shall allude briefly to the more esoteric phases of his life.

The Rev. T. Frederick Hardwich was born at Wells, Somersetshire, in 1829. He is the son of a naval officer, who, after his retirement from active service, resided in this old cathedral town. Mr. Hardwich, jun., was educated at a public school in the West of England, attaching himself more expressly to the study of mechanics rather than to mathematics, greatly to his detriment in afterlife. This necessitated subsequent excessive study, which, in turn, brought on a delicate state of health, and from which Mr. Hardwich was not free for many years.

In 1847 Mr. Hardwich entered the Medical Department of King's College with the intention of taking his degree as a physician; but, after completing the prescribed course of study, he was compelled to relinquish the idea from increasing debility of constitution. In 1849

he joined the chemical class under Professor Bowman, and so rapid and thorough was his advance that shortly afterwards he was appointed Curator of the Museum and Demonstrator of Practical Chemistry.

His first attempt at original research was an examination of the vegetable butter used by the natives in a portion of India, and known as the oil of *Bassia latifolia.* In this substance Mr. Hardwich detected a new acid, to which the name of "bassic acid" was given. For this communication the Council of King's College awarded him the Daniel Scholarship, which is given every four years for the best series of original chemical researches carried out in the laboratory of King's College since the previous award.

Mr. Hardwich became associated with photography just at the period when the daguerreotype was on the decline and the collodion process of Archer was beginning to find favour. Having spent a day with Dr. Diamond, and witnessed the working of the process, he was enchanted with it, and on his return to his laboratory he at once set to work with the best and most perfect apparatus and the purest chemicals, but could not produce anything worth looking at. Having consulted with Dr. Diamond as to the cause of his failure he was informed by his mentor that the chemicals were probably *too* pure, and that better success would, perhaps, be secured after the collodion and bath had been in use for a short time. He now resolved to enter upon a systematic study of the then youthful art-science, which he soon afterwards did with the greater readiness in consequence of having been told that no practical chemist had as yet given his mind to the fascinating art, and that much of it as then practised was merely by the "rule of thumb." The guide-books of the period were of the most meagre kind, and in these an infinite number of the smaller details essential to success were altogether omitted.

THE REV. T. F. HARDWICH.

FROM A PHOTOGRAPH BY MR. ST. GEORGE.

About this time Mr. R. W. Thomas, of Pall Mall, was known as the maker of a collodion of superior quality. Mr. Hardwich found in this a production far better than that made by Archer himself; but its composition was concealed, and his secret was profoundly kept by Mr. Thomas. The demand for high-class collodion was in those days very great; but with the exception of that to which allusion has been made little or none was to be found in the market until Mr. Hardwich published the papers to which we shall hereafter refer, and which proved of the greatest possible utility to a large number of collodion makers who subsequently entered this field of manufacture, none of whom, writes Mr. Hardwich in a private letter, even made any acknowledgment of their indebtedness to him.

When his formula was first published many complained that they could not work it; but in the cases investigated failure was found to arise from the use of impure chemicals. It was not, in Mr. Hardwich's estimation, a question of a formula which could easily be varied, but it was one connected with a principle. His discovery was this—that the oil of vitriol had an important function to fulfil in the manufacture of pyroxyline for photographic purposes, viz., to condense the fibre and to produce what are termed the "organic reactions." Until this was recognised there was a certain amount of truth in the assertion of some person who said that if Thomas were to shut up his shop many London photographers would have to close their doors, owing, doubtless, to the fact of his collodion being the only one that would work in a weak light.

To photographic printing, as well as to the preparation of the collodion, Mr. Hardwich gave a great deal of his attention, and was the first to show that the toning then in use was due to the action of sulphur. As the readers of photographic literature eighteen years since are aware, Mr. Hardwich attempted to substitute the tetrathionate baths (for the preparation of which formulæ were published at the time) for the old hypo.; but he afterwards found that sulphuration of all kinds must be avoided. While he lays no claim to the introduction of alkaline gold toning, we certainly owe much to Mr. Hardwich in connection with that process, for his bringing it out of obscurity, in giving a definite formula, and demonstrating experimentally that the prints were permanent.

As regards dry and preservative processes, Mr. Hardwich was mixed up with them from the beginning; was present at the trial of the nitrate of magnesia process of Spiller and Crookes *versus* the rival processes of Shadbolt and Llewelyn, and satisfied himself at that time that, although the Spiller and Crookes idea of a preservative was original and good, an organic preservative like honey was far better than an inorganic one. In Shadbolt's process the nitrate of silver was left on the film when the honey was applied; in Llewelyn's the free nitrate was washed off. By using gallic acid in the preservative Major Russell made a great step in advance, density being obtained with almost any kind of collodion. When the latter gentleman introduced his tannin process it was tried with great success by Mr. Hardwich, who found that it gave qualities not to be secured by any of the other methods mentioned, inasmuch as it gave density with nearly every description of collodion, in conjunction with good keeping qualities. In his practice he found the Taupenôt process always safe, but very troublesome and the negative somewhat hard. It must be remembered that the improved methods of developing Taupenôt negatives now in use were at that time unheard of, and we need scarcely add that emulsion photography was at that period also quite unknown.

At the time Mr. Hardwich published the first edition of his *Photographic Chemistry* the principal book worthy of attentive perusal was Hunt's *Photography.* In the latter volume were recorded numerous interesting experiments, although the book itself was out of date so far as the practice of the day was concerned. His *Photographic Chemistry* Mr. Hardwich designed to be not a mere compilation of the results of the labours of others, but a record of his own experiences; hence he read and tried everything he could meet with—English, French, and German—introducing nothing into his work that was not found to succeed. He also kept a note-book in which all the failures reported to him by the best operators—Fenton, Lake Price, Frith, Watkins, and others—were entered and the remedies ascertained as far as practicable.

It was in 1861 that Mr. Hardwich resigned the office of Lecturer on Photography at King's College, and left London, having taken orders in the Established Church. He took this step, not from any sense of dissatisfaction with his previous pursuits, but prompted by a sincere desire to be useful in a more congenial sphere of labour and with a hope of improving his health by residence in the purer air of a country parish. This hope has, we rejoice to say, been in a great measure fulfilled, although his strength has not been sufficiently recuperated to permit of his adding scientific pursuits to the ministerial work of the large and populous parish in the county of Durham in which his lot is cast.

Although Mr. Hardwich always considered his vocation to be of a practical character—to perfect photographic processes and reduce them to certainty—he did not entirely neglect the theory of the art. He served on a committee appointed by the British Association to determine the nature of the photographic image. The popular idea had previously been that it consisted of metallic silver, the colour varying with the size and arrangement of the molecules. By a simple experiment Mr. Hardwich showed that the silver was fre-

quently in combination with organic matter. A sheet of gelatine soaked in a solution of nitrate of silver and exposed to the sun's rays assumes a clear red colour and becomes insoluble in boiling water.

Mr. Hardwich was incontestibly the most arduous investigator in photographic science of his day, and the most prolific contributor to the serial literature of photography. There is a refreshing smack of originality about everything he has written, and it must be universally acknowledged that he was an unwearied experimentalist. It was unanimously felt that the authorities of King's College, in establishing a Photographic Department under the sagacious management of Mr. Hardwich, did good service to the art. Scarcely a day passed without some more or less eminent personage in his own special department of the art-science calling at the well-known laboratory of Mr. Hardwich to "compare notes," among whom we may mention the name of Dr. Thompson, now Archbishop of York.

It is difficult to select for special mention any one among the multitudinous results of the incessant application to scientific work of Mr. Hardwich; but we imagine that if he were asked to mention what he himself considered of the highest importance among his "labours more abundant," he would reply—his researches in connection with the chemistry of photographic collodion, and the *rationale* of the processes used in making that important substance.

The mere enumeration of a few out of the *numerous* communications made by Mr. Hardwich to the Photographic Society, the *Journal* of that Society, and to The British Journal of Photography will irresistibly attest his great mental activity. We present the following in the order in which they were published, commencing in 1853:—*On the Nitrate Bath; On the Collodion Process; On Protonitrate of Iron; On Direct Collodion Positives; On Alum; On the Chemistry of Printing; On the Development of Invisible Images; On the Fading of Positives; On Impurities of Acetic Acid; On Impurity of Chemicals; On the Nitrate Bath; "Photographic Chemistry" (reviewed); On Positive Printing; On the Salts of Gold in Positive Printing; On Spots on Collodion Plates; On Toning Positives (Mr. Sutton's Process); On the Action of Damp Air on Positives; On Agencies Destructive to Photographs; On the Chemical Composition of the Photographic Image; On the Chemistry of the Photographic Image; On Collodion; On Collodion for Dry Processes; On the Decomposition of Iodised Collodion by Keeping; On the Exposure of Positive Prints to a Sulphuretting Atmosphere; On Fused Nitrate of Silver; On Glycyrrhizine in Negative Collodion; On Impurities in Commercial Nitrate of Silver; On the Manufacture of Collodion; On Mr. Maxwell Lyte's Process; Notes on Preservative Processes; On the Oxymel Process; "Photographic Chemistry" (reviewed); On the Photographic Properties of Citrate of Silver; On Protecting Photographic Prints with a Coating of Varnish; On Toning Positives; On the Use of Alum; On Minute Photographs and Reversed Action of Light; On Glycyrrhizine in the Negative Bath; On Glycyrrhizine; On Printing Stereoscopic Transparencies; On Vignette Printing; On the Salts of Iron as Developers for Collodion Negatives; On the Solarisation of Negatives; On the Preparation of Photographic Pyroxyline; On Nitrate of Silver for the Negative Bath; On Decomposition in Collodion; On Further Experiments with Nitrate of Silver; On Nitrate of Silver; On Gold-Toning Applied to Albumenised Paper; Remarks on the Death of Mr. Howlett; On Old Silver Baths; On the Examination of Collodion; On the Use of Sensitive Collodion for the Dry Process; Photographic Experience in Australia; On the Iodide and Bromide of Magnesium; On the Spontaneous Decomposition of Pyroxyline and Collodion; On Collodion for the Dry Process; On a Dry Collodion Process Suitable for Large Plates; On the Manufacture of Photographic Collodion; On the Collodion Committee; On the Value of Collodion as a Photographic Agent; On the Present State of our Knowledge Regarding Photographic Collodion; On the Present State of our Knowledge Regarding the Photographic Image.*

We might have added much more concerning Mr. Hardwich's photographic work, but sufficient has been said to demonstrate the great services he has rendered to photography. His treatise on *Photographic Chemistry* is still highly prized by all photographers as a trustworthy guide.

It gives us unalloyed pleasure to be able to state that Mr. Hardwich, notwithstanding the cares and hard work consequent upon ministering to the spiritual welfare of a populous parish in a mining district, has not quite lost sight of his old love; and we here take occasion to say that great delight was experienced by many when his once familiar name again appeared attached to a communication in the pages of The British Journal of Photography.

Although in another page in the present number we have dwelt at considerable length on the subject of Mr. Hardwich's article on pyroxyline reprinted last week, we can scarcely here avoid making reference to the ideas published so long ago by that gentleman, probably the earliest, and up to the present time the greatest, authority on matters connected with collodion. One fact cannot fail to strike any modern reader, namely, the very slight advance that has been made in our knowledge of pyroxyline since the article in question was first published. Written upwards of fifteen years since, when dry-plate photography may be said to have been in its earliest infancy, the statement of the requirements necessary in a dry collodion process tallies so directly with what we are in the habit of searching for at the present time, as to make us regret more than anything else has done that Mr. Hardwich should have retired from the active pursuit of photography before the great secret of the manufacture of pyroxyline has been satisfactorily solved. The remarks contained in the paper in question on the subject of the organic reaction of pyroxyline and other substances with silver salts, though written at a time when those substances were generally believed to be neutral to such influence, are entirely in accordance with what is now known of the behaviour of different descriptions of pyroxyline when employed in any of the dry processes. One other point—the addition of potash to the collodion—appears to us noteworthy. The conclusion arrived at by Mr. Hadow, as well as by Mr. Hardwich, that this addition brought about the formation of a trace of *nitrite* in the collodion, recalls to our mind the recommendation of Mr. M. Carey Lea and others, very recently, to add traces of nitrite of potassium to the collodion to be employed in emulsion work, and also the advantages now supposed to be derived from the presence of nitrite of silver in the bath, proving the correctness of the views entertained by Mr. Hadow and Mr. Hardwich in the early days to which we have referred. A thorough and systematic investigation into the composition and formation of photographic pyroxyline is sadly needed at the present time, and we know of no one more competent to conduct such an investigation than the last-named gentleman, if he had but the leisure to undertake the task.

We may just add that our esteemed *confrère* is of a singularly mild and undemonstrative disposition. His simple, loving, and earnest nature finds congenial occupation in his parochial work, and it is difficult to say whether he is more beloved by the swarthy sons of toil who form the majority of his extensive flock or by his fellow-labourers in the ministerial office. We sincerely hope that his eminently useful life may long be spared. When our friend's life-work has been accomplished—he

> "Whose peaceful Day benevolence endears,
> Whose Night congratulating conscience cheers"—

and when his character comes to be summed up by those among whom he has so faithfully laboured, it may be done, most aptly, in those sacred and expressive words—"He went about doing good."

The photograph from which our engraving is made was taken by Mr. St. George, formerly of Regent-street, London.

## FOREIGN NOTES AND NEWS.

Death through Poisoning by Cyanide of Potassium.—The Sudden Breaking of Glass Vessels.—Toughened Glass.—New Solution for Rendering Various Materials Impermeable.—Dry Albumen Plates.—The Importance of Careful Printing.—Retouching in France.—MM. Rotter and Waldack's Researches.

The Brussels *Journal of Medicine* gives an account of the death of a photographer caused by poisoning by cyanide of potassium. He was rubbing his hands with a moist piece of cyanide, in order to remove the silver stains, when a small portion broke off and slipped under the nail of one of the fingers where there was a raw place. He immediately felt a sharp pain, and became giddy. In order to remove the cyanide he unfortunately used an acid which dissolved the salt and formed prussic acid. The giddiness increased, fever set in, his face became pale, his eyes sightless, his strength failed, and his speech became affected. An inmate of the house entering the room by chance found him in this condition, and immediately called in a doctor. The doctor succeeded in restoring the patient so far as to enable him to give an account of the occurrence, but was unable to save him. The dangerous symptoms increased, the patient became decidedly worse, and the following night he died.

Hugenbach remarks that glass often breaks suddenly without any visible cause—a fact that has given rise to many conjectures and superstitions. It has, however, been generally supposed that the interior of such glass is more expanded than the exterior, in consequence of having been too quickly cooled—as in the case of

Bolognese flasks and Rupert's drops—and that when scratched by, for example, a grain of quartz a slight change of temperature or an almost imperceptible concussion may be sufficient to cause breakage. This state of tension can be recognised by polarised light. If this theory—that the cause of the sudden breakage of glass vessels is to be attributed to the same cause as the extreme friableness of glass tears—be tenable, then colours should also be seen in these glasses when examined by polarised light. This is actually the fact, as Hugenbach has ascertained by observation in the cases of a drinking-glass and a glass dish, which broke of themselves; in the latter the colours were very decided and vivid. Hugenbach has also examined by polarised light a number of other glass vessels, some of thick glass, but it is only in very few cases he has been able to distinguish even slight traces of colour. A writer in *Poggendorff's Annalen*, in speaking of Hugenbach's observations, suggests that his theory might be turned to practical account in glass works by a new utilisation of polarised light. He would have each separate glass vessel examined by polarised light, and reject those in which any decided colour was discernible.

MM. de Luynes and Feil recently presented a report to the French Academy of Sciences on M. de la Bastie's method of toughening glass. Theorists have suggested that the bubbles which appear more frequently in toughened glass than in ordinary annealed glass are also caused by the contraction of the interior mass after the exterior has cooled; at any rate, it has been ascertained by experiment that they appear at the very moment when the toughening process is to all intents and purposes completed. They were observed both when a quantity of carefully-prepared crown and flint glass and a number of large balls of St. Gobain glass provided by M. Biber were toughened. On the glass being annealed a second time the bubbles were very much reduced in size, but on being again tempered they reappeared as large as ever. Further experiments showed that, though the bubbles disappeared on the glass being annealed, they always reappeared on its being re-tempered; but the re-tempering never developed bubbles which were not present before the annealing.

Generally speaking, toughened glass cannot be cut in the usual way; but there are certain exceptions to this rule. For instance: a circular plate of glass can be safely pierced through the centre, but if it be pierced or cut in any other place it breaks. A square of toughened glass from the St. Gobain works, when examined by polarised light, showed a black cross, the arms of which ran parallel to the sides of the plate. Such a plate can be sawn through the cross, but it can neither be cut nor bored in any direction beyond those lines. The molecular condition of a plate of toughened glass thus cut in two seems to be changed; for, on being examined with a polariscope, the divided halves show dark, fringed stripes. When two halves are laid exactly one above the other the dark stripes disappear, but when the position of the upper half is reversed they reappear as if the plate were twice its real thickness. From that it is inferred that toughened glass, like Rupert's drops, is always in a state of tension, and that the direction in which it can be safely divided can only be ascertained by examination of the glass by polarised light.

The *Revue Industrielle* gives an account of a process for rendering various materials—such as wood, leather, felt, textile fabrics, cardboard, paper, drain pipes, &c.—impermeable, which has been patented in France by M. Dujardin. The method is as follows:—Pulverise three hundred and thirty-five grammes of aluminic potassic sulphate along with an equal quantity of plumbic acetate; to this powder add two hundred grammes of sodic sulphate and the same of potassic bicarbonate. Mix well together and add five litres of water and one hundred and twenty grammes of calcined sulphate of magnesium, and keep stirring until the whole be dissolved. Pour the mixture into a large tub containing fifty litres of water in which one hundred and fifty grammes of soap has previously been dissolved. Finally dip the object it is desired to render impermeable in this solution.

In *Anthony's Bulletin* Mr. Pickerill publishes the following formula for the preparation of dry plates, discarding altogether the use of collodion:—

| | |
|---|---|
| Albumen | 4 ounces. |
| Honey | 3½ „ |
| Iodide of potassium | 60 grains. |
| Bromide „ | 15 „ |
| Dried chloride of sodium | 5 „ |

The mixture is beaten up into a froth and allowed to rest for from twenty to twenty-four hours, when it is carefully filtered. A clean glass plate is covered with this mixture, dried by means of heat, and when cold sensitised in the usual manner.

The *Journal de Photographie*, in the course of a series of short articles upon the different manipulations connected with portraiture, speaking of printing, says that such is the importance attached to this portion of the work by M. Adam-Salomon, that he invariably does his own printing; and M. Soulier, also, is in the habit of watching personally the production of the magnificent pictures which have rendered him famous. These remarks are made, however, rather from a retoucher's point of view than as affecting the printing proper, for the *Journal* goes on to describe the secret of success, which is nothing more nor less than an elaborate system of working-up the negative in various ways. Directions are given as follow:—The negative must be taken with full detail and but little density; after varnishing it is placed upon a retouching easel, and the lights washed over with carmine, on the reverse side of the plate, until the desired contrast is produced. The negatives thus treated must be printed in a weak, diffused light, and through one, or sometimes two, sheets of ground glass. This is the gist of the whole process (?), which our contemporary claims to publish for the first time!

A rather ingenious, if practicable, method of retouching is also mentioned. It consists of the application of light itself to the purpose. A small hole is made in the shutter of the dark room, and the rays of light passing through are permitted to fall upon those portions of the image which require strengthening. This is literally retouching with a real *pencil* of light, its advantage arising from the fact that the effect is produced without leaving any traces of artifice.

The second portion of the report of MM. Rottier and Waldack upon the developing action of ferrous salts is promised shortly. The latter gentleman has taken exception to the remarks we made upon the subject in our issue of June 4, and promises to reply to them in the coming report.

# Meetings of Societies.

## EDINBURGH PHOTOGRAPHIC SOCIETY.

The first ordinary meeting of this Society after the summer recess was held at 5, St. Andrew-square, on the evening of Wednesday, the 6th inst.,—the President, Dr. Thompson, in the chair.

The minutes of the previous ordinary and five outdoor meetings were read and approved.

A large number of pictures, the work of some of the members during the season, were laid on the table for examination. Some observations on the processes and methods of manipulation by which the pictures were produced were made by several of the exhibitors. On the suggestion, however, of Dr. Nicol, it was resolved that a portion of the time of each of the forthcoming ordinary meetings should be occupied by an exhibition and a detailed account of the work of one member; and, as it was understood that failures as well as successful pictures should be shown, it is hoped that much general information may in this way be elicited.

The Chairman then gave an interesting account of the several outdoor meetings he had attended, and said he was very well pleased with the beer and albumen process, which he had almost exclusively wrought. He considered the addition of gallic or pyrogallic acid, or some similar body, absolutely necessary for the successful working of that or any other dry process. He (the President) further added, in answer to the question of how long the preservative might safely be kept, that he made up as much as would last during the season, and that the addition of a small quantity of an alcoholic solution of salicylic acid entirely prevented decomposition. He was, he said, decidedly in favour of rather long exposures, and he generally removed the trace of fog which was produced during development by a wash of a weak solution of iodine in iodide of potassium, followed by the application of a weak solution of cyanide of potassium, when the required density and brilliancy would be found to be easily produced by pyrogallic acid and silver.

Mr. W. H. Davies then read a paper on *Photographic Etching on Glass* [see page 498], and showed some specimens of work done in that way.

The Chairman was much interested in Mr. Davies's paper, but thought that he was somewhat mistaken in supposing that Messrs. Malloch and Co. claimed anything more than the mere varnish or coating which they applied to the glass, and which was of such a nature that a pencil drawing could be readily transferred in the ordinary way and then traced or etched with any fine point, giving lines of perfect sharpness. So far as the method of etching was concerned, it was useless for anyone to lay claim to it—in recent years at least—as it was

well known that it had been done by Fox Talbot more than a quarter of a century ago, and both Bingham and Hunt described an exactly similar method which had been proposed by Mr. Havell.*

Mr. Norman Macbeth wished to corroborate all that Mr. Davies had said about his (Mr. Macbeth's) connection with the matter. His attention had been directed to it in consequence of his son scratching with a graving tool the films of some negatives he was washing off the glass, and exposing some sensitised paper under them. The result suggested to him an easy way of multiplying sketches, the only drawback being the difficulty of properly judging as to the the progress of the work on the darkened collodion film, and the apparent rottenness of the lines. Acting on Mr. Davies's suggestion he obviated the former by using a simply-iodised plate, which was subsequently blackened, as explained by Mr. Davies; and the latter drawback was removed by a substratum of albumen. On plates so prepared his son had done a great many things, and, so far as he could see, there was nothing in Messrs. Malloch and Co.'s preparation that was in any sense an improvement on what had been described before the Society in 1868.

[Specimens of etchings on Messrs. Malloch and Co.'s plates, and lithographic copies made from them, were handed round for inspection, and were very much admired.]

Mr. Turnbull said that he had seen some of Mr. Malloch's plates more than a year ago, and thought they were admirably adapted for the purpose intended. The varnish seemed to be a mixture of wax and a yellow pigment, combined with a drying oil of such a nature that it got dry without becoming hard.

Mr. Dobie thought there was possibly some misapprehension between Mr. Davies and Mr. Malloch. So far as he could understand Mr. Macbeth had confined himself to printing on sensitised paper from the etchings he had made, while Mr. Malloch reproduced them by photo-lithography. Now, if that were original with him, he deserved all the credit of the idea.

Mr. Neilson believed it was quite possible that Mr. Malloch never thought of making any claim in the matter, but that the article was wholly the work of the reporter, who, probably, not knowing much of photography, and admiring the undoubtedly fine results that had been produced, thought the whole thing new, and had written accordingly.

Dr. John Nicol said the matter lay in a nutshell. Whether Mr. Malloch did or did not make a claim for the whole process was not exactly the question, but was the claim made for him in the paragraph from the *Scotsman* which Mr. Davies had read? He thought it was, and that Mr. Malloch by his silence had accepted it. If so, then it was clearly their duty as a Society to put the matter right and give credit only where it was fairly due. The public generally knew very little technically about photography, but looked to the societies and to the journals for their information, regarding it pretty much as too many do who look to their favourite newspaper for their politics; and, therefore, the societies should be always careful to send out no uncertain sound on any question coming fairly before them.

Mr. Mathieson then proceeded to show on the screen a series of very fine transparencies of animals which he had made from negatives kindly lent by Mr. Forster, of Coldstream. They consisted of horses and men apparently engaged on the ordinary work of the farm, such as ploughing, carting, cow-milking, &c., &c., and were very much finer than anything of the kind ever previously shown before the Society. He also exhibited some fine transparencies, from his own negatives, of Edinburgh, Melrose, Dryburgh, &c., &c. The lantern was illuminated by Turnbull's triple-wick lamp, which has recently been much improved, and which, under his own management, gave such a brilliant disc that on several occasions the effect of the picture was enhanced by slightly lowering its intensity.

At the close of the exhibition votes of thanks were given to Mr. Foster, Mr. Mathieson, and Mr. Davies, and the meeting was adjourned till Wednesday, November 3, when the annual meeting for the election of officers, &c., will be held.

## Correspondence.

The French Academie des Sciences.—The Late Partial Eclipse of the Sun.—A Novel Invention.—The New Giant Reflecting Telescope.—Enamelled Pictures.—M. Leon Vidal's Chromo-Photographic Process.

The French Academy of Sciences held its meeting on Monday last, the 4th inst. A note was read from M. Angot having for its subject the late eclipse of the sun and the service rendered to astronomy by photography.

M. Angot said:—"The daguerreotypic positives and dry-plate negatives which I have the honour to lay before the Academie des Sciences were obtained at the Observatory of the Bureau des Longitudes, by the same method and by the same instruments which were employed by M. Andra and myself in the Isle of St. Paul, when observing the late transit of Venus.

"It is well known that the apparatus is composed of a perfectly plane mirror, which reflects the image of the planet to be observed into a horizontal telescope having a focus of three metres eighty centimetres and thirteen centimetres in diameter. The photographic image is obtained in the focus of the lens achromatised by the separation of the two glasses which form the lens.

"By the forethought of M. le Commandant Mouchez the instrument was placed in the Observatory of Montsouris,* exactly in the same position, and under the same conditions, as it was worked in the Isle of St. Paul. The "orientation" and separation of the lenses, and also the focus, were identical, in order that the proofs of the last eclipse could be carefully examined, and the results compared with those obtained during the transit of Venus. The exact moment of the contact, as also the second, in which each proof was taken was electrically written upon the chronograph, to which was also confided the measuring of the distances of the '*corne*' observed by the equatorial telescopes. This will give occasion to some very interesting comparisons between the direct or ocular observation and those made by the aid of photography. The number of proofs obtained sufficiently good to be measured during the eclipse were eighteen by the daguerreotype process and twenty-five on dry plates.

"I desire to make a final remark about the negatives which were obtained on dry plates, as I think it will be useful to all who occupy themselves with scientific photography. The images before you were obtained on dry collodion prepared by Professor Stebbing fifteen months ago, at the moment when we were about to start on our voyage to the island of St. Paul to observe the transit of Venus. These plates have endured successively every change of climate—that of the Red Sea in the month of August, and that of Cape Horn during the winter—without their sensitiveness being altered."

M. Mouchon, a professor of mathematics at Tours, presented for the inspection of the same learned body a new apparatus with which he can concentrate the sun's rays and thus obtain sufficient caloric to put a small steam-engine in motion. This is done by means of a reflector having the same form as an ordinary lamp shade and inclined at an angle of forty-five degrees to its axis. The condensed heat of the sun penetrates through a large glass cylinder that is placed inside the vessel which contains the water; but when it gets there, according to the expression of M. Mouchon, "it is caught in a trap and cannot find its way out again." Five quarts of water can be raised to boiling point in eight minutes, and steam can be got up to four hundred degrees Fahrenheit by the same apparatus.

In answer to a question put to him by the President the inventor assured the members that the heat was sometimes so intense that he was obliged to diminish it. It is said that M. Mouchon possesses (at Tours) a steam-engine which works admirably as soon as it is exposed to the sun's rays.

Unhappily the weather was very stormy on Monday last, so that I had not the opportunity of seeing the sun take the place of gas and coal. As it is, every one does not require a steam-engine, but every photographer would, I am sure, be very thankful to M. Mouchon if he would instruct the community how to have boiling water always at hand, if it were only to cook his potatoes free of charge; thus a great economy would be made in his outlay in the kitchen, which is not to be disdained when the price of fuel is considered.

The giant reflecting telescope of the Paris Observatory is finished, and will soon be placed at the disposal of the astronomers for their observations. I had the honour to visit this colossal instrument in the company of M. Wolf, who very kindly explained all its mechanism. It is a *chef d'œuvre* of engineering skill and mathematical precision, and the largest in the world. The reflecting mirror was made by M. Martins, who has become celebrated from the manufacture of his plane mirrors. The greatest honour is due to M. Le Verrier, the Director of the Observatory, for the active part he took in the construction of this extraordinary instrument, which, although it weighs several tons, can be turned in any direction even by a child. M. Le Verrier has the intention not only to replace all the astronomical instruments under his care by others constructed agreeably with the present state of astro-

* We understand that Messrs. Malloch and Co. wish it to be distinctly understood that the only claim they make in connection with the matter is for the preparation with which the glass is coated, which they believe to be superior to anything that has yet been proposed; and they consider that by its introduction they have given an impetus to a hitherto much-neglected branch of art.—Eds.

* A kind of branch establishment to the Observatory of Paris, situated a little to the south.

nomical science, but he intends to construct another telescope double the size of the one now to be seen in the beautiful park of the establishment.

Enamelled proofs are *à la mode*, and perchance it may be welcome to some to know how the operation is conducted here in order to obtain the best results. After having perfectly cleaned a glass plate—which must be without imperfections, such as scratches, waves, &c.—take a piece of cotton-wool, dust a little talc on the glass, and rub it over the surface in every direction; then collodionise the plate. Any old collodion placed aside because it did not work well in portraiture will do for this purpose, instead of going to the expense of making new. This will prove very economical to many photographers who have old collodion lying on their shelves. But, if the collodion be old and contains iodides or bromides, when the plate is coated it must be plunged into a water bath in the same manner as a wet plate would be plunged into the silver solution, then washed for a minute or two under a tap, and set up to dry. This washing is only to eliminate all the soluble salts. If uniodised collodion be employed the washing is not necessary. During the preparation and drying of the plates take twelve ounces of water and put into it one ounce of gelatine to soak (half-an-hour is sufficient); pour it into a porcelain dish, and stand the latter in a hot-water bath. The gelatine dissolves rapidly. When melted pour into it sixty minims of glycerine; stir up, and filter through cotton if necessary. Take a thickish piece of ordinary white paper, a little larger than the proof to be glazed, and lay it down in the solution to soak; act in the same manner with the proof. During this time the collodionised plate is to be slightly warmed. Take the proof out of the solution, lay it carefully on the collodion to prevent bubbles, lay over it the white paper, and press out the excess of liquid with a felt roller or with the hand. The plate is then set up to dry during the night; the next morning a knife is drawn round the edges of the proof, and the landscape or portrait, beautifully glazed, detaches itself from the glass support.

Decidedly chromo-photography is *un fait acquis*. M. Leon Vidal, by the magnificent specimens exhibited in Paris, has proved what can be done by his process, and the favour it has already met with from the public is sufficient to predict its success. I am told that the firm has already received an order from the city of Paris alone for several thousand proofs. Last week M. Leon Vidal did me the honour to forward me two of the first pictures produced at his new establishment; and, if anything were wanting to enhance the praise bestowed on his productions, the wonder, astonishment, and pleasure expressed by visitors to my house in looking at, and hearing the history of, those pictures would be a sufficient testimony as to the merits of the invention. Indeed, it is impossible at first sight, and even after a somewhat close inspection, to do otherwise than take the pictures for oil paintings—the productions of a great master. In fact, and as if to render the difficulty greater, even the warp and the woof of the canvas is visible through the transparency of the paint.

M. Vidal, from being a distinguished amateur, indefatigable in his researches, has now become the director of a large manufactory, which bids fair to be not only a great commercial success and a source of wealth to France, but, what is more, his idea will bring art within the means of the working man, so that the ornamentation of his dwelling will become such a source of instruction and pleasure as to preserve him from the pernicious influence of the beerhouse. If only this be attained society will indeed have cause to be thankful to one who has brought ease, comfort, and happiness to thousands. E. STEBBING, *Prof.*

3, *Place Bréda, Paris, October* 11, 1875.

## CANON BEECHEY'S PROCESS.

*To the* EDITORS.

GENTLEMEN,—Although I have rather looked to the bath process as calculated to give results approaching wet collodion, there was, at first sight, so much calculated to produce a favourable impression upon an amateur in the formula of Canon Beechey, as given in the last number of the Journal, that I forthwith proceeded to give it a trial; but on further examination of the details there appeared so much of discrepancy as to make it desirable to understand how far some mistakes regarding quantities may exist.

After giving the details of the preparation, Canon Beechey remarks that the emulsion will contain with sufficient exactitude for all practical purposes eight grains of bromide, sixteen grains of nitrate of silver, and two drops of acid per ounce. Now, while the formula does give sixteen grains of silver, it gives not quite six and a-half (viz., $6\frac{4}{10}$) of bromide (instead of eight grains) and $1\frac{8}{10}$ drops of acid (instead of two drops) per ounce in the perfected emulsion. So far as regards the discrepancy in respect of acid it may, indeed, be well passed over; but the difference between eight and $6\frac{4}{10}$ grains of bromide seems too serious to be overlooked.

The quantity stated of gun-cotton per ounce and the proportions of alcohol and ether may, of course, be as intended; but $4\frac{8}{10}$ grains of cotton per ounce seems small, and three parts of alcohol to two of ether unusual proportions.—I am, yours, &c., OLD AMATEUR.

*October* 5, 1875.

[Probably Canon Beechey will assist our correspondent out of the difficulty under which he labours.—EDS.]

## COMBINATION PRINTING.

*To the* EDITORS.

GENTLEMEN,—I see in last week's Journal an article, by Mr. Dunmore, respecting combination printing; and, as I am a licensee, and have seen Mr. Tilley work his patent combination process, I beg leave to inform Mr. Dunmore that his (Mr. Tilley's) patent includes the production of a mask taken on a separate part of a plate or on two separate plates; that is, the portrait on one half and the mask on the other half of the plate—the plate to be divided afterwards—or on two separate plates before the sitter moves from the place occupied. Thus you see this mask and portrait can be used to enlarge from, or to print from any background negative the photographer may choose, without using any transparency in the dark slide, such mask and portrait to be used for two separate printings in the same way that I presume Mr. Dunmore uses them. But with Mr. Tilley's process all stopping out of the background and cutting out masks is dispensed with, as we have the two masks (background and figure) photographed on the two plates. Thus any photographer can use his own artistic taste in printing-in the background, and have them correctly joined, with much less trouble than in the old method.

I see some of your correspondents have complained of the backgrounds being too sharp and well defined. That I consider a good fault, as it is very easy to allow a greater distance between the transparency over the sensitive plate while in the slide, thus throwing the former a little out of focus; or the transparency need not be made quite so sharp when taken from the negative.

I feel sure Mr. Tilley's system will be *the* process used in the future for combination printing, on account of its quickness and simplicity; for what is more simple than to obtain the combination negative direct in the camera and have it ready at any time to print from without any masking or stopping out?—I am, yours, &c., R. G. ARNOLD.

*Market Drayton, October* 12, 1875.

## STUDIO LIGHTING.

*To the* EDITORS.

GENTLEMEN,—The photographic world was undoubtedly on the *qui vive* for the advent of Mr. Vander Weyde's patented system of lighting the studio; but since the appearance of your very lucid article in a recent issue of your invaluable Journal, giving a descriptive and illustrated account of it, the fraternity seem to have settled down again in their wonted state of quietude.

After a persual of that article and its diagrams I beg to say I am somewhat sceptical as to the originality of the principle of the patent, in proof whereof I have the pleasure of sending you a photograph of the studio I have been operating in for years past, from which you will observe that the very idea is used in constructing the window, so as to transmit all the rays of light directly on to the sitter, and to prevent any from reaching the camera—the essence of Mr. Vander Weyde's system.

This studio was erected about twelve years ago. Its position is about south-east and north-west; and, in order to meet the exigencies of the situation, the window is made in a sort of semicircular form, so as to secure a northerly light, as well as to obtain a more unobstructed line of light.

That portion of it facing north is of glass only, placed at various angles. The uprights, also placed at certain angles, are of inch board, each being edgewise to the sitter, thus effectually serving the purpose of illuminating the sitter only and giving deep shade at the camera.

The window is not perpendicular, but inclines inwards and converging towards the roof.

The front is lighted, as you will see, by a sloping window, and another window on the opposite side, facing the south-west, is of the ordinary character—a flat light.

The ground plan of the erection is in shape something like a funnel cut in halves vertically. The studio is only adapted for using the camera at one end.

Now I venture to think, gentlemen, from the photograph and description I have given that you will concur with me when I say that Mr. Vander Weyde's patent does not cover an entirely new idea, but is only an amplified, yet certainly an ingenious, application of the same

principle used by my predecessor—my own brother—now deceased. Were he still living, I do not know whether, in his modesty, he would lay claim to any originality in the contrivance. Certainly, when contemplating the erection of this place of business, he studied long and carefully before deciding upon the adoption of this plan; and this I know, too, that he consulted the columns of your Journal for articles, editorial or otherwise, for information on the subject of lighting, and he culled therefrom much to assist him in arriving at the conclusion he did. No builder assisted in contriving or erecting the studio; my brother and myself alone erected the woodwork, and glazed and fitted it up entirely.

Further: my late brother sent to your office a small model of the studio for your inspection and opinion, and, if my memory serve me rightly at this distance of time, you gave him a private and very favourable reply.

I do not say anything as to the merits of this system of lighting the studio, not courting controversy; but this I may say—that, on the face of it, it seems to be as near perfection as our present knowledge of the subject of lighting will carry us.

If the publication of the present communication serve no other purpose it will help to place the honour of priority on the head of the right person, and be *in memoriam* of a man who was a patient, earnest, although a silent worker, but who at all times used brains in aid of every other appliance in pursuit of the true and beautiful, both for his own pleasure and in furtherance of an art of which he was an ardent disciple.—I am, yours, &c., J. BROWN.

3, *Kinmel-street, Rhyl, October* 12, 1875.

[We recollect quite well receiving the model referred to. It stood on one of the shelves in our office for three or four years, and was similar to the studio now shown in the photograph enclosed. The form of studio advocated by Mr. Vander Weyde is, however, somewhat different from that described by Mr. Brown.—EDS.]

## EXCHANGE COLUMN.

A new 5 × 4 bellows camera with folding back offered for a Fletcher's stove or small litho. press.—R. M. D., 45, Geldridge-road, Eastbourne.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

GEO. NESBITT.—Received. In our next.

J. CHAFFIN.—Thanks for the information.

J. DAER.—The locality is an improving one; but we could not take the responsibility of advising the erection of a studio there at present.

J. B. S.—The alcohol has contained water, hence the failure. It is not at all necessary that absolute alcohol be used, but it is important that it be very strong.

NEMO.—The characteristic quality of all your prints is hardness. This is most probably owing to insufficient exposure or in not adapting the developer to the plate.

M. S. A.—The angle of polarisation varies with the number of plates of glass employed in the construction of the polariser. With twelve plates of crown glass Brewster found that the angle was 74°; by increasing the number to twenty-four the observed angle of polarisation was decreased to 60°.

G. B. BRADSHAW.—If you put definite queries respecting enlargements by the lime light we should then be better able to reply. To develope the image with pyrogallic acid form the sheet of paper into a tray by bending up the edges; then pour into it a small pool of the developer, rapidly spreading it over the surface by means of a bent glass rod.

MAJOR JACKSON.—The "casket miniature" was not introduced by the deceased gentleman named, but by Mr. Henry Swan. The time of its introduction, if we recollect aright, was in 1863, on the occasion of the Newcastle meeting of the British Association. The optical principles involved in its production are sound, and reflect the greatest credit upon the gentleman who in this manner so ingeniously applied them.

AMATEUR (Bingley).—We cannot advise you to make emulsion in the manner you propose. It may do well enough by way of a passing experiment to while away an hour or two; but if you desire to succeed without failure, and without encountering much delay, we recommend you to commence operations with a plain collodion, and add bromide and silver to it in definite proportions, as described by several writers. The method you propose, however, is the best that could be adopted under the circumstances—that is, by using the old collodion.

NOLENS VOLENS.—As benzole does dissolve india-rubber it is probable you have either been supplied by your chemist with mineral oil or, at any rate, some substance other than that required, or that the india-rubber has not been of a soluble kind. The sample of rubber enclosed by you is of this latter description. It is very fine, close-grained, and dark in colour. We have placed a cutting from it in sulphide of carbon, which does not affect it. On doing the same with a cutting from a square of pure rubber the latter has dissolved. It cannot be too well known that the semi-vulcanised rubber so generally met with at stationers' shops is insoluble; the best kind may also be obtained from the stationer, but it is in irregular forms and has a streaky, white appearance. In selecting a piece for dissolving remove the outside of it by means of a sharp knife. The action of the light and atmosphere upon a piece of rubber impairs its soluble properties.

ALEX. WOOD.—The following formula for a picture varnish will answer your purpose:—Copal, twenty ounces; dammar, twelve ounces; mastic, eight ounces; methylated spirits, one gallon.

LIONEL.—The emulsion being somewhat thin will, we imagine, cover the number of plates mentioned. The emulsion should be used up; but if it be not convenient to do so add a little bromised collodion to it—just so much as will leave the soluble bromide in excess—and in this state it will keep well for a long time. The addition of sufficient nitrate of silver to it to leave this latter salt in excess will make it ready for use at any time. Thanks for calling attention to the omission of the alcohol. In place of the five ounces of water the formula should read "water four ounces, alcohol one ounce."

REV. J. E.—If there be only a slight difference between the foci of the two portrait lenses that may easily be overcome and the pair brought into exact similitude, in respect of focus, by increasing the distance between the front and back lenses of the combination having the shorter focus. This will increase the length of the equivalent focus, and, by comparing the images formed by the pair of lenses between each adjustment, a certain point will be found in which the dimensions of the images will be alike. At this stage the foci will be identical, and the two lenses may afterwards be employed on a binocular camera.

PHOTOGRAPHY IN BIRMINGHAM.—"Amateur," writing from Birmingham, says:—"It seems that Birmingham, which in most things keeps pace with the times, is, so far as photography is concerned, rather behindhand. Certainly, we have several of the best men of the day amongst us, but there does not seem to be that activity which is displayed in other towns. My object in writing is to ascertain the desirability of establishing a photographic society in Birmingham. I should think this might easily be accomplished if some gentleman, or gentlemen, of sufficient influence could be induced to take the matter in hand. I have heard several of my friends say that they would willingly join if one could be started, and as no one else seems inclined to do so, I will set the ball rolling."——We endorse the remark of our correspondent that Birmingham has some very able men residing there. It is a pity that a meeting could not be held and a society established, or rather, re-established, for Birmingham once possessed a flourishing photographic society.

IN TYPE.—Articles by "Mark Oute;" Herr Josef Ungar; "Free Lance;" D. K. Griffiths; and *Notes on the Photographic Exhibition*, by a Visitor, &c.

PHOTOGRAPHIC FASHIONS.—Messrs. Minister and Son, of 8, Argyll-place, London, have issued with their report of fashions photographic copies of their plate of new styles of dress for the autumn and winter. Twenty-two figures are shown, and among the novelties is a new lady's frock coat.

MRS. JULIA CAMERON.—A sale of the whole of Mrs. Cameron's effects, including photographic apparatus, pictures, furniture, and residence, at Freshwater Bay, Isle of Wight, took place this week. This lady, whose name is so well known in connection with art-photography, is, with her husband, about to leave this country for Ceylon.

PHOTOGRAPHING CRIMINALS.—Among the contracts sanctioned by the Corporation of Liverpool at the monthly meeting on Wednesday, the 6th inst., was one for photographing the prisoners at the Borough Gaol for twelve months, ending 31st October, 1876, which was taken by Messrs. Vandyke and Brown, Liverpool, for the sum of £60.

MONSTER TELESCOPE.—The largest refracting telescope ever made in this country is about to be constructed for the Imperial and Royal Austro-Hungarian Government by Mr. Grubb, of Dublin. It is intended for the new observatory now in course of erection at Vienna. The objective will have an aperture of over twenty-six, but probably twenty-seven, inches, according as the discs of glass, which are being manufactured in the rough by Feil, of Paris, may turn out on finishing. The focus is to be about thirty-two feet. Its construction is expected to occupy between three and four years.

## LONDON GAZETTE, *Friday, October* 8, 1875.

PARTNERSHIP DISSOLVED.

M. P. TENCH and G. A. LOVERIDGE, Fleet-street and Denmark-street, Camberwell, opticians.

## METEOROLOGICAL REPORT,

*For the Week ending October* 13, 1875.

Observations taken at 406, Strand, by J. H. STEWARD, Optician.

THESE OBSERVATIONS ARE TAKEN AT 8.30 A.M.

| October. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 7 | 30·38 | W | 49 | 51 | 65 | 47 | Hazy |
| 8 | 30·21 | SW | 54 | 57 | 61 | 50 | Hazy |
| 9 | 29·70 | WNW | 51 | 54 | 61 | 53 | Cloudy |
| 11 | 29·30 | W | 49 | 52 | 56 | 49 | Dull |
| 12 | 29·37 | W | 37 | 38 | 54 | 37 | Foggy |
| 13 | 29·20 | SE | 42 | 43 | — | 37 | Foggy |

CONTENTS

# THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 807. Vol. XXII.—OCTOBER 22, 1875.

## RESTORING FADED DAGUERREOTYPES.

A case tried at the Southwark County Court, and reported in another page, calls for a few words.

Many photographers, now that enlarging is so successfully practised, have daguerreotype portraits entrusted to them to be utilised in the production of enlargements. Many of these portraits are faded to such an extent as to render their reproduction a matter of much difficulty; and, as the majority of professional photographers throughout this country have entered the profession *since* the days when the process of Daguerre formed the chief means by which portraits were taken, it is reasonable to assume that some of them, at least, may not be aware of the best method by which these faded pictures may be restored. For such the following hints are intended.

If the fading assume the form of a brown stain commencing at the margin and extending inwards, obliterating the details in its onward course of destruction, the picture thus affected is susceptible of restoration. But when a picture has a feeble, sickly appearance, the surface being clean and free from oxidation but the details imperfectly visible, by no means at present known can the details be with certainty restored. It is much safer and better for the photographer to whom such a daguerreotype is entrusted for the purpose of being cleaned or reproduced to decline having anything to do with it. The appearance we have described is strongly suggestive of an attempt having been previously made to restore the picture by the very means to which in all probability it owes its existing state of deterioration, viz., friction by a piece of wash-leather. Unless a daguerreotype have been very strongly "gilded" it will most assuredly succumb to friction, even with the softest wash-leather. When first developed and fixed in hyposulphite of soda the whites of the picture are, speaking from a mechanical point of view, composed of a number of atoms which adhere very slightly to the plate; by the subsequent act of "gilding" these atoms are not only whitened, but made to adhere more tenaciously to the silvered surface of the metallic plate. When the atoms are once removed by friction the whites can no more be restored. Many daguerreotypes are imperfectly gilded, while many more have not been gilded at all.

The brown stain to which we have referred is soluble in a solution of cyanide of potassium; so that by the application of this menstruum such stains may be removed with unfailing certainty. But it also happens that by the action of the same solvent the whites are removed, and hence the need of a great amount of care. Fortunately, however, the whites are not attacked by the cyanide of potassium unless it be of a degree of strength greater than is required for effacing the stain. Owing also to the fact of time being an important element in the action of the solvent—by which we mean that a solution sufficiently strong to remove both the stain and the whites effects the former in less time than the latter—it is possible by means of a tolerably strong solution of the cyanide to clean daguerreotypes without not merely impairing the purity of the whites, but with a positive enhancement of their beauty. The way in which we prefer to proceed in the cleaning of a daguerreotype is as follows, and we give it in the form of a brief lesson for a tyro:—

Have provided in readiness, and within reach of the hand, a small pair of pliers, a lighted spirit lamp, a jug of common water, a smaller jug or bottle of distilled water, and a solution of cyanide of potassium of the degree of strength which would suffice for the rapid fixing of a collodion negative.

Now take hold of one corner of the daguerreotype by means of the pliers, and pour a small quantity of the plain water upon the surface so as to ensure its being wetted. Next apply the cyanide solution, pouring plenty of it on; observe the surface with the utmost attention, and watch for the disappearance of the brown stains. The instant this takes place dash plain water over the surface and examine the picture, but without allowing it to become dry in any part. Should traces of the brown stain still remain repeat the application of cyanide with the subsequent dash of water. Now remove the whole of the common water by washing the surface with the distilled water; and while the plate is, so to speak, loaded with the water, hold it over the flame of the spirit lamp, keeping it in as level a position as possible. When the plate has been thus heated incline it gently towards the end at which it is held, so as to let the water drain downwards, while preserving a level edge at the top of the plate. Now blow gently on the upper end of the plate, and the water will retreat before the blast, leaving the plate perfectly dry and free from the slightest stain. The last drop of water at the lower corner may be removed by being touched with a bit of blotting-paper. When dry the daguerreotype must be immediately protected by glass; and on no account should the surface be touched, except by the liquids mentioned, during the whole operation.

By adopting the method here described with a degree of minuteness that "old stagers" will recognise as quite necessary, any careful tyro possessing a modicum of skill will be enabled successfully to accomplish the task of restoring a daguerreotype.

## THE LESSONS OF THE PHOTOGRAPHIC EXHIBITION.

### III.—Apparatus.

On the table in the Photographic Exhibition is a solitary piece of apparatus, a changing-box, which, however, is inspected with much interest.

Seeing the number of visitors from the provinces who attend the annual exhibition of the Photographic Society it is to be regretted that facilities are not afforded for bringing together a collection of novelties in connection with photographic apparatus. We venture to state that such an exhibition would be thoroughly appreciated.

An attempt is made to supply the shortcomings of the London Photographic Society by the "technical exhibition" of the South London Photographic Society; but it does not answer the purpose as efficiently as would the supplementing in the same direction of the former Society's annual exhibition, because, notwithstanding all the energy and *bonhomie* displayed by the lesser luminary—notwithstanding the fact that its Vice-Presidents and those of the parent body are in some instances identical, and that the Secretary of the South London Photographic Society is also Assistant-Secretary of the elder Society—the former body has not attained the status of the

latter. It is tolerated, spoken kindly of, and even patronised, by the photographic public, but is not looked upon as a body having prestige and authority.

But, again: the South London Photographic Society's "technical exhibition" occupies only one evening. It is frequently very inconvenient for photographers to attend an exhibition on an evening definitely fixed upon, and it sometimes occurs that they will not make a sacrifice of convenience to attend the meetings of a society holding a second-rate position as regards social status. Many would be willing enough to attend such an exhibition provided no other engagement interfered; but whist parties, chess parties, and billiard matches sometimes claim paramount consideration, and such engagements usually secure attention in an inverse proportion to the status of the society putting forth rival attractions. The South London "technical exhibition," excellent and valuable though it be—and that it is both we freely admit—does not quite meet the case.

What is required is an exhibition, not of processes — for an ordinary meeting of a society is the place for these—but of apparatus of a novel and useful nature, to be accessible to all comers for a few weeks, with some intelligent person deputed to be in attendance in order to explain the nature of such exhibits to interested visitors. Failing such personal explanation, a printed or written intimation of the salient features of each article exhibited might answer the purpose. If an optician be desirous of exhibiting a new lens he should fix it upon a camera, and plainly and intelligibly state its nature, construction, and aim, show in what distinctive features it differs from pre-existing lenses, and then permit the public to draw its own conclusions as to its value. Or, if the piece of apparatus be a camera, a card intimating its peculiarities should be attached, showing in what manner the various movements of expansion—lateral and vertical—swinging, focussing, and packing up are effected, contrasting these with previous systems. So with camera-stands, showing rigidity and portability; while tents and developing-boxes, again, would alone almost furnish *matériel* for an interesting exhibition.

It may be said that an exhibition of appliances of this description would introduce matters partaking of the character of the "shop." Be it so. But the "shop" is never eliminated from such exhibitions; and, so far as we know, no attempt has ever been made to make such elimination. What we contend for is this—that an exhibition of a photographic society should be made to partake of an educational character as much as possible; and when, as in the case of these annual displays, visitors come from a considerable distance to ascertain what is being done as respects art-progress, it would be well to embrace the opportunity of imparting to such visitors the greatest possible amount of information in all that relates to our art-science.

## ON THE PRODUCTION OF TRANSPARENCIES IN THE CAMERA.

As a fitting conclusion to our two previous articles on the subject of transparencies we propose to speak of the method of their production by means of the camera upon wet or dry plates, and, also, to describe what we consider the best arrangement of apparatus for stereoscopic purposes. In view of the extreme simplicity attaching to the plan of printing by superposition it will, doubtless, appear to some of our readers an unnecessary extension of labour to treat of the more complicated method—more complicated on account of the introduction of additional apparatus, both optical and mechanical; but there are certain specific advantages belonging to the latter system which render it advisable to include it in the list of means at command, and which we will briefly mention.

There are, we know, very many of our readers, both amateur and professional, who invariably employ the wet process for their negative work, and who would, without doubt, be unwilling to have recourse to dry plates for the sole purpose of printing transparencies. They would therefore be, to a certain extent, shut out from that branch of photography, or, at best, limited to the unsatisfactory process of printing by superposition without contact by the ordinary wet process, if the camera were not available. Again: as we have before remarked, stereoscopic pictures are now almost invariably taken upon plates larger than was formerly the case, and it frequently happens that the size to which we are limited by the exigencies of the stereoscope is insufficient to include as much of the subject as might be thought desirable. Under such circumstances the use of the camera enables us to reduce the scale of the negative so as to bring within the restricted space at command such portion of the picture as may be wished.

In dealing with the preliminary coatings, in our article of last week, we spoke of another substratum we intended to mention later. One of the minor inconveniences connected with the production of transparencies for the stereoscope by direct printing consists in the fact that, unless printed from a reversed negative, the finished picture, in order to be seen in its correct position, must either be viewed *through* the ground glass with which it is mounted or must be taken upon the polished side of the latter. Each alternative has its disadvantages. In the one case the finer details of the picture are lost and its clearness destroyed; in the other, the exposed surface of the ground glass attracts dust and dirt with great rapidity, and, if not frequently cleaned, gives a most unsightly appearance to the transparency. The substratum we spoke of is intended to obviate this defect, and consists of a semi-opaque film placed between the image and the glass, fulfilling the twofold purpose of substratum and ground glass.

The semi-opacity is obtained by means of an emulsion of gelatine and oxide of zinc or other white pigment of suitable density. The gelatine solution must not be stronger than is necessary to keep the pigment in suspension, and if oxide of zinc be used it must be ground very fine and passed through two thicknesses of linen to remove the coarser particles. A very convenient plan is to obtain a tube of Chinese white (water-colour, not oil) and rub up a sufficient quantity of this with the warm gelatine solution, thus avoiding all trouble in grinding. The employment of this mixture as a preliminary coating involves a little more labour than either albumen or india-rubber; but the result, for the reasons we have named, will be found more satisfactory.

Here, however, the use of the camera again proves to be an advantage; for by its means the picture may be reproduced upon the sensitive plate, so as to be seen in its proper position when viewed *through* the glass. This enables us to mount the ground glass with its obscured side inwards, thus entirely removing the defect to which direct prints are liable. This, of course, refers entirely to stereoscopic work, and, in the same connection, the arrangement of apparatus we are about to describe does away with the necessity for cutting or otherwise reversing the two halves of the negative.

The camera we recommend is constructed on the principle of the ordinary copying camera, but is furnished with a central division and a pair of lenses instead of a single one. As there is no very intricate workmanship about it, it may be made by the nearest joiner, or by the photographer himself, and need not cost more than a few shillings, unless a special dark slide be provided for transparencies alone. This, however, is unnecessary, as the camera may be made to suit the wet slide of the landscape apparatus. The lenses may be the ordinary stereo. landscape ones; but it will be found a decided advantage if they are of the doublet or other form giving non-distorted pictures. Six inches will be a convenient focal length, though it is of little importance what focus the lenses are except as it affects the length of the camera.

This (for a pair of six-inch lenses) should consist of a base-board at least thirty-six inches in length, in the centre of which is a fixed body eighteen inches long, fitted with sliding bodies, either rigid or bellows—preferably the former—so as to be capable of extension in either direction. A slot in the centre of the fixed body permits the insertion of a slide carrying the lenses, which should be so mounted as to be capable of movement further apart, or *vice versâ*, as may be desired. One end of the camera is to be fitted with a frame to hold the negative, and if different sizes be employed it will be necessary to have separate frames or else carriers similar to those used in the dark slide fitting into the largest size. This arrangement should be constructed so as to move vertically or laterally in the same

manner as the movable front of a landscape camera. The opposite end of the box is merely arranged to receive the dark slide in the usual way if a special slide be employed; but if the slide belonging to another camera be utilised it will be necessary to insert a "mask" as near as possible to the sensitive plate in order to protect the margin of the transparency. The mask may be cut out of sheet zinc, and it will be well if two or three with apertures of different shapes and interchangeable be kept on hand in order to suit the exigencies of any particular negative. If a special slide be employed for this camera alone it will be preferable to construct it so as to allow of the insertion of the mask between the sensitive plate and the shutter, rather than in the camera, in order to obtain more clearly-defined marginal lines, though in that respect the latter arrangement leaves very little to be desired.

As regards the mechanical arrangements and working of this camera we may say a few words. If it be desired to reproduce the image the same size as in the negative it is merely necessary to place the negative twelve inches from the lens, or, more correctly, from its optical centre, and to focus. To decrease the trouble connected with this operation marks may be made upon the base-board showing the exact position of the two halves of the camera. If it be necessary to reduce the image slightly the negative must be moved to a greater distance from the lens until the required diminution is obtained. The camera, as we have described it above, permits of a reduction to one-half the size of the original, or, on the other hand, an enlargement in the same proportion—considerably more than is likely to be required with even the largest size of stereoscopic negatives.

The dark slide being, of course, so arranged as to hold the sensitive plate exactly in the centre of the field of the lenses, it becomes necessary to provide means for bringing any required portion of a large negative opposite to that centre. This is effected by means of the sliding front, the action of which must not be confounded with that of the separation of the lenses. The latter motion alters the distance between the centres of the two pictures, and gives great power in producing more or less stereoscopic effect according to the character of the subject.

In using this apparatus the negative is fixed by means of two small springs in the carrier of the sliding front, with the varnished side *outwards* or *away from the lens*. The transparency will then, when viewed *through the glass*, be found to have suffered the necessary reversal, and the two halves will occupy the same position as if cut and reversed in the manner usual with paper prints. If the picture is to be viewed from the film side it is only necessary to reverse the negative in the frame, placing the varnished side towards the lens. The why and wherefore of this apparently self-acting process of reversal we shall not now stop to consider, but a few moments' thought on the part of our readers will place the whole matter in a clear light.

The next subject is the method of illumination, which will require some little care. The most generally satisfactory, as well as the cheapest, plan for amateurs, and one we should recommend, is to place in front of the camera a large sheet of white paper or cardboard inclined at an angle of forty-five degrees with the sky. This gives a very even illumination, but, unless in sunshine, the exposure will be rather long. For evening work, if the amateur be the possessor of a lantern the problem is at once solved. Place the lantern upon the table in front of the camera, and at such a distance that the disc of light just covers the negative. If at this distance the illumination be not perfectly even insert a sheet of finely-ground glass between the lantern and the negative, at a distance of a few inches from the latter, taking care to place the *ground* side towards the light.

If a lantern be not available it will be necessary to have recourse to two or more gas or paraffine lights—preferably the latter—shaded by means of ground glass in order to equalise the illumination. Better still will be found the plan of M. Pokorsky Joravko described in our number for August 20, which we can confidently recommend to our readers for this and many similar purposes. The exposure in these cases will, of course, depend upon the nature of the light, and can only be found by experiment.

Having described fully the mechanical arrangements we can now proceed to the few remarks which remain to be made upon the practical part of the process. If dry plates be preferred they may be used with as good results as wet ones, and nothing further need be said of their preparation. In using wet plates no special deviation from ordinary practice will be found necessary, but one or two hints upon the collodion may be of use. It is well known that in most dry processes very great latitude in exposure and development is allowable; but this is not the case with wet plates. It arises from this that many negatives which give satisfactory prints upon dry plates refuse to do so upon wet ones, simply because the operator does not go the right way about the business. With a thin, delicate negative, full of detail but possessing no density—such a negative, in fact, as is usually recommended for purposes of reproduction in the camera—we should recommend a tolerably old coloured collodion and an acid bath. With a dense, hard negative, on the contrary, possessing marked contrasts, the best results are produced by a new collodion containing a full quantity of bromide, or it may even be entirely bromised; this will tend to give a more harmonious picture, reducing the harshness of the original negative. By bearing these principles in view no difficulty will be experienced in producing good results from almost any negative.

It only remains now to speak of the finishing and mounting of the transparency, by whatever process it may have been prepared—a subject upon which we can say but little that is not already known. Much of the beauty and finish of the transparency depends upon the purity of the margin; this, if clouded or fogged, we clean by removing the film as follows:—Upon the surface of the picture lay down carefully a stout card with a perfectly straight edge, so as to cover the whole of the plate but a strip an eighth of an inch wide; then, with a chisel kept for the purpose, run along the margin, using the card as a guide, and scrape off the collodion. Repeat this on all four sides; for the division in the centre a strip of watch-spring of the right width, sharpened, may be used. When this has been completed cover the plate with diluted albumen (one part albumen to three of water) and dry; this serves the purpose of varnish without affecting the detail of the picture. The picture is then placed in contact with a piece of finely-ground glass of the same size (unless the semi-opaque substratum we have described be used, when plain glass is employed), and the edges carefully bound with strips of black paper, which may be obtained of dealers in photographic materials, and the transparency is complete. It is needless to say that the ground glass is omitted in mounting transparencies for the lantern.

## PLEA FOR *CARTE* PORTRAITS.

In our "correspondence" columns in the current number will be found a letter advocating the giving of greater encouragement to the production of *cartes de visite*. It is somewhat singular that so little is done to stimulate this useful and popular style of portrait. Large portraits, compared with these, are mere fancy articles for which there is only a limited demand, and, as the writer tersely shows, their production is confined to those who are fortunate enough to possess extensive studios, and able to purchase large and necessarily expensive lenses and apparatus. In such an exhibition as that advocated—namely, one confined to *cartes*—the members of the photographic body would be far more evenly pitted against each other than has hitherto been the case in any exhibition where magnitude in size is one of the understood elements of success.

It is a well-known fact that many artists can produce exquisite photographs on the diminished scale of say a quarter or sixth size who, for the reasons at which we have above hinted, would entirely break down in the attempt to produce a whole-plate or larger picture. But for this very reason the class known as our "best" men—a distinctive term not wholly disassociated from commercial standing—would not care to risk their reputations in a competition with those of their brethren who occupy less desirable positions, and who, perchance, might produce works of equal merit. No one knowing anything of photography is unaware that pictorial gems *may* be, and often have been, produced by apparatus involving an insignifi-

cant outlay; and such being the case there would scarcely be any limit to the number of those qualified for enrolment as exhibitors, so far as the possession of the mechanical means of competing was concerned. But that much benefit indeed would arise from such a competition or exhibition we entertain no doubt; and it would be an advantage different in character from that associated with the display of such works as now find a place in our photographic exhibitions; for it would, more directly than anything else, tend to elevate the style of those who cater for the general public, thus influencing the national taste.

The liberal prizes presented by Mr. Crawshay for direct life-size heads did act most undoubtedly as a stimulus, in consequence of which the best class of works of that description which *could* be obtained with existing appliances were produced; but these were, in a sense, fancy articles for which not one in a thousand of the public cared. Far different would it be with the *carte* portrait, which has secured so strong a hold on the affections, if not the necessities, of the public as to preclude the hope of its ever being eradicated.

There is one point in the suggestions of Mr. Nesbitt which it would be vain to attempt to introduce, namely, the recognition of the ability of the *operator* in connection with an exhibition of photographs. By "operator," in this sense, we, of course, mean *employé*. Before employers would consent to allow their assistants' names to be associated with the production of photographic works of art and technical excellence human nature, we imagine, would have to be remodelled. There are not more than two or three establishments in London that could afford to do so small an act of justice or grace to its *employés;* the reason for this is too obvious to need comment.

In fine, while we should like much to see a *carte* exhibition—certain that, if properly managed, it would prove beneficial—we entertain but little hope that such an exhibition will soon be held—at least under the auspices of the London Photographic Society, inasmuch as this body, by virtually excluding *cartes* from their exhibitions, tacitly announce to the world that in their opinion amplitude in dimensions is an important element in artistic merit.

## THE PHOTOGRAPHIC EXHIBITION.

[Fourth Notice.]

As a consequence of the high position achieved last year by Messrs. Chaffin and Sons, one is prompted to look with increased interest at their productions this season, when, owing to the absence of any incentive for producing heads of dimensions of a definite number of inches, exhibitors are free to indulge their own ideas regardless of considerations of pecuniary advantage. Accordingly we have in the pictures exhibited by these artists not a single specimen of direct life-size heads, but, on the contrary, an admirable collection of portraits and groups—still large in dimensions, but by no means approximating to life size. This we regard as a great improvement. Of the various pictures contributed, those of *Silver Grey* (No. 108), *Belle and Bow* (124), and *Marie* (73) are probably the finest, as they are the most attractive; but with such an original as that last indicated it would be difficult indeed to produce other than a dainty picture.

Of Mr. Faulkner's works it is sufficient to say that they are not inferior to anything previously exhibited by this artist. But in *Dorothy Morrison* and *Simplicity* (70) we find two pictures, enlarged from a small instantaneous portrait of a child, which are probably the finest—certainly among the finest—combinations of art and photography ever exhibited in this country. The composition is comprised of the portrait of a pretty, innocent child skilfully photographed, enlarged upon opal glass in carbon, and deftly worked on by an accomplished artist. What more could be desired? On no account should Mr. Faulkner's frame of children's portraits (397) be passed without careful examination.

A variety of beautiful views are contributed by Mr. G. Mansfield. The tone and treatment of this artist's pictures leave little to be desired; but we have a strong conviction that by adopting a mounting-board of a cold, grey tint he has detracted from the effect of his charming pictures. As an example of the latter quality in Mr. Mansfield's work we may instance a view of the Liffey (143).

Some of Captain Turton's pictures are mounted on boards of a similar colour to those to which we have just directed attention. This, of course, is a matter of taste; but, in our estimation, a mount of a warm tint serves to display a photograph more effectively than a board of a cold tint. Captain Turton has contributed the only collodion positives on iron plates present in the Exhibition. His *Group of Cattle* (75) is valuable as a study, attributable to the fine picture of a cow in the foreground.

Messrs. Barry and Co. exhibit a frame (90) of four excellent "imperial" portraits. A little picture, *The Pixies' Spring* (92), by Mr. F. T. Palmer, is an exquisite bit of landscape work. *After the Ball* (100) is the suggestive title adopted by Mr. Hooper for a charming picture of a little girl reposing in a chair after her return from an evening's enjoyment.

In a frame (117) of eight imperial portraits, by Mr. E. Greaves, will be found some fine specimens of photography. Mr. Greaves has adopted a style which could hardly fail of being effective, and which we commend to the attention of portraitists, viz., printing his portraits in vignette, and then, by means of a suitable mask, lowering the tone not merely of the margin, which would otherwise be white and glaring, but of those portions of the figure which should be kept in subordination. This gives force and prominence to the face and a delightful softness to the picture as a whole. In this frame we recognise an excellent portrait of our contributor, Mr. J. W. Gough; but the most effective is that of a gentleman with arms crossed, the modelling of the face being exquisite.

Mr. F. M. Sutcliffe exhibits several *genre* pictures possessing great merit. *Its Me, Grannie* (89), representing a child at a cottage door waiting for admission, is a happy example of Mr. Sutcliffe's pictorial fancy. *Tired of Waiting* (157) is another fine picture.

*Barkly Thorpe* (95) is the designation given by Messrs. Burton and Sons to a collection of four attractive landscapes. These artists contribute other excellent pictures, among which we may point to *Ann Hathaway's Cottage* (300).

Mr. Crawshay exhibits a large number of views this year, in which he does himself far more justice than when, as on previous occasions, he associated himself prominently with a style of portraiture but little appreciated. Many of Mr. Crawshay's landscapes are of a very high class, and possess great merit both of a technical and artistic character. He has also made pictures out of the most unpromising material—a railway bridge, for example. *Scethrog Lane* (80) is a capital example of Mr. Crawshay's style and one of the finest landscapes in the exhibition. He contributes largely, and we have not seen an indifferent picture in his collection.

## GENERAL REMARKS ON DRY PLATES.

In all photographic work, wet or dry, our object is to obtain a correct representation of all gradations of tone from light to shadow. In the wet process this is not a matter of any great difficulty. In the dry it is otherwise, and it is only of late years that dry-plate work is beginning to be quite freed from the reproach of harshness. But its tendency, when it errs, is not always necessarily on the side of excessive contrast; it is, on the contrary, possible to frame dry processes which do not exhibit sufficient contrast. It could scarcely, therefore, be otherwise than that intermediate methods free from both these evils should exist.

In order to study the relations which exist between dry plates and their rendering of lights and shadows let us take, on the one hand, an ordinary iodo-bromised plate prepared with a nitrate bath, and subsequently washed and treated with tannin or coffee; and, on the other, a collodio-bromide plate, washed and coated with gum. Let us suppose both these plates to be exposed on a view including in its different parts all gradations from a very strong light to complete shadow. Suppose the gradations of light to be divided into a scale of a hundred parts—1 representing absolute shadow, and 100 sunshine upon snow.

If the coffee or tannin plate have been fairly exposed we shall find that the varieties of light have been tolerably well rendered up to a certain point. The snow in the sunshine being rendered by white paper, the other strong lights will appear in a diminishing scale until

we reach, perhaps, twenty, where the light was no longer capable of producing a developable impression by any exposure not injurious to the other end of the scale.

On making a similar experiment with the collodio-bromide plate, sensitised with gum, we get a result that is completely inverted. The capacity for being acted upon increasingly only extends to a certain point. A certain strength of light—let us say eighty—is capable of making, with the exposure best suited to the general needs of the plate, the maximum of impression which the film can receive. The degrees of strength beyond this can do no more; therefore, all grades beyond eighty are equally dense in the negative. In this case we find the high lights running together. The sky, perhaps, is no denser than the roof of a house. All brightly-lighted objects in the distance come out equally strong, and so become entirely confused. If a wall consist of brightly-lighted stones of different shades, these may all come out alike. As just said, the high lights have all run together; but this is to be carefully distinguished from the results of simple over-development. In an over-developed plate the high lights that become confused print white; whereas in the case we are considering they are not opaque, but print in half-tone, yet without distinctness. In over-development the grades a little below the highest light have come up alongside of the highest light, and print as opaque as it; but in the case of the gum plate the highest lights refuse to advance to their proper place, and remain stationary alongside of what ought to be several grades below.

In the collodio-bromide process the silver bromide is never able of itself to yield the same opacity as the mixed iodide and bromide do in the processes with a nitrate bath. The bromide depends for good results on the presence of such organic matters in the collodion as give intensity. It consequently follows that in the emulsion processes we are obliged to supplement the gum preservative with some other substance—such as gallic acid, coffee, or tannin—to increase the density; yet, nevertheless, if the collodion be not of the intense kind there is a general want of vigour in the whole image, and the high lights run together. This effect is almost always experienced when it is attempted to work the collodio-bromide process with an ordinary negative pyroxyline. (Here the use of silver iodide comes in advantageously.)

When there is a want of the intensity-giving power both in the collodion and in the preservative the most remarkable effects of weakness in the high lights may present themselves. When I spoke just now of the high lights running together it was simply with the intention of expressing that they assumed too equal an opacity and printed alike. But if there be an entire want of intensity-giving power both in the collodion and the preservative the exact boundaries even between strong tones and half-tones may almost or even quite disappear.

I said just now that certain processes (of which the coffee process may be taken as a type) were incapable of rendering all the lowest shades of light at all; and yet I have before me an exquisite photograph representing a scene that includes a sheet of water, trees, houses, and distant mountains, taken with the coffee process by a skilful friend. Everything is in perfect keeping as to tone. The foreground is not the least chalky though in full sunshine, the water is transparent, white houses show detail, and the distance is soft. This seems incompatible, perhaps, with the character I have ascribed to the process; but it is not. The explanation is simply this: my friend who took it knew exactly what he could do, and chose his scene accordingly. The *photograph* exhibits every gradation from white to black, but the *scene did not*. All the lower grades of light are completely absent. The dark portions of the print which throw out the light are found on examination to be trees in the middle distance in full sunshine. They are well rounded and full of detail, it is true, but they would not have been had they lain in shadow.

The distinction which I have here made is an important one, and one often overlooked. It does not follow that because a photograph shows every shade from white to black, with great variety of half-tone, that the process is necessarily a perfect or even a very good one, unless, indeed, the photographer mean to limit himself to scenes of an exactly similar character. Perhaps the easiest of all photographic subjects is a widely-extended view, with a diversified play of light, yet nowhere badly lighted. Many dry processes will render such a scene satisfactorily, and yet entirely fail to cope with one in which the contrasts are greater. Perhaps this additional strength of contrast may be scarcely apparent in the landscape itself; but if it exist the plate will assuredly find it out.

It is not, however, to be supposed that wet-plate work is entirely free from these same difficulties. A wet collodion used with a bath, which satisfactorily renders scenery marked in great contrast, will be apt to fail in rendering a well-lighted scene. This is so true that some painstaking wet-plate men carry with them two collodions—one of which contains an extra dose of bromides, to be used when the contrasts are likely to be too strong.

To cope with the difficulties that arise from non-actinic objects, like trees in shadow, is one of the difficulties in dry-plate photography, and a difficulty which is to be met and mastered, not eluded, by carefully-chosen scenes. There are few objects more beautiful for photographic delineation than streams in deep ravines, vistas through woods, and other similar combinations, which almost always include shaded foliage. There are many districts in which such scenes are the only attractive ones to be found, and where broad views, sufficiently diversified, can rarely be found. If dry-plate photography were to be limited to these last many persons would be almost debarred from practising it.

And here, in passing, I stop to enter a protest against a commonly-quoted test object—*ivy*. It is not uncommon to cite the power in a plate to render ivy foliage shaded as a proof of sensibility to weak radiations. Now ivy, so far from being a difficulty, is just one of the very easiest of all possible objects to photograph in sun or shadow; for even in shadow its glistening leaves reflect back so much light from the clouds, or even from a clear sky, that every leaf stands out upon the plate. It is a most beautiful subject for the camera—none more so—inexpressibly attractive, but also exceedingly easy, and almost impossible to fail in. Let no one quote it as a proof of good work. A plate that will render detail in an *evergreen tree* in the shadow, and at the same time preserve its high lights in due relation, is a really good one. Compared with the ivy test this is an exceedingly severe one. The leaves of the evergreen reflect exceedingly little light, and, as I have tried to show before on more than one occasion, the proper green colour of leaves has but faint actinic power. The leaves of the evergreens, therefore (I refer to Norway firs, silver firs, silver pines, hemlocks especially, and trees of similar habit), require a long time to reflect light enough to impress the film, and whilst that is being done the high lights are most severely tried.

Coffee, tannin, and other similar plates will not bear this test. The only dry plates that I know of that will are the collodio-bromide, and those not always, nor with any *very* brilliant object included at the same time. Still they do it better than any other.

Plates made in the negative bath and heated with coffee or with tannin do not (at least in my experience) bear this test. It is only the best emulsion plates that are competent to conquer such difficulties, and these only when managed with ability and experience.

I spoke just now of the use of two different collodions in wet-plate work, employed to enable the photographer to master the effect of two different styles of scenery. We accomplish something of the same sort in dry-plate work by varying the development. If the whole scene have been well lighted there will always be danger of too flat a negative, and in such cases a redevelopment with acid silver and pyro. is sometimes exceedingly useful. This is the true utility of that sort of development. A good dry plate should always give sufficient *density* by the alkaline development alone, though it may fail to give sufficient *contrast* where the illumination has been equal.

Coffee plates made with the negative bath give their best results with alkaline development; the time of exposure is thus shortened to less than half. But I object to the olive colour of which the image is composed. It is so very non-actinic that it is difficult to judge of the extent to which the development has gone, and if the image be made even a little too dense the result is very chalky. It is curious that an olive colour in plates is so much more non-actinic than brown of apparently equal density; the latter will print through when the former refuses to do so at all.

If in a dry plate the details in the shadows refuse to come out until the continued development renders the sky opaque enough to print white there is a serious fault somewhere. And the fault may always be traced to one or another of the following causes:—1. Insufficient exposure. 2. If the exposure have been made with judgment, then the photographer has made a bad selection of view. In these will occasionally be found combinations in nature beautiful to the eye, containing, nevertheless, contrasts of light and shade so very great that no process, wet or dry, can master them. Certain objects are capable of sending back very annoying quantities of light—dead trees that have lost their bark and have their wood bleached with sunshine and rain, some such retaining a polished surface, and if the sunlight fall on them from the side making a most powerful impression; white stones in the beds of creeks, water-worn and polished, and lying in sunshine;—these objects are easily coped

with, provided that the view be well lighted all over, but when combined with darkly-shaded foliage they constitute series of difficulties.

1. *Insufficient Exposure*—the effects of which are too well understood to need comment here.

2. *Bad Selection of View.*—Everything has its limits; the methods I have already described are those which best cope with difficulties of contrast. But there are shadows so dark that they will give detail with no exposure that will not obliterate detail in the high lights. It is, moreover, worthy of remark how differently different persons will succeed with equal means—some will contrive to carry the power of controlling contrasts so much farther than others. To a large extent this power is based upon the faculty of *seeing* faults. Some persons do not recognise bad work, and will exhibit with pride prints from negatives which others would have made haste to destroy. Neither is it always that want of experience is the cause. Some men will paint all their lives and never make a decent picture, and the same thing is true of some photographers. To those who cannot criticise severely their own work an honest friend who will do so is invaluable.

3. *Unsuitable Processes.*—Enough has been already said under this head to indicate that certain processes are suitable for certain kinds of work, but fail entirely in others. As no photographer would wish to limit himself to scenes of a particular character the object must be to obtain processes which best adapt themselves to widely-varied conditions.

M. Carey Lea.

## ALBUMEN AND THE NITRATE BATH.

[A communication to the South London Photographic Society.]

One ought to apologise to the South London Photographic Society, which takes such special cognisance of the art-claims of photography, for bringing before it matters simply of technical or scientific detail; but my excuse must be as before—that perfection in the more material parts of the work leaves the mind free to devote full attention to the artistic claims of the picture.

Probably it may be assumed that a majority—I had almost said a large majority—of photographers give a preliminary coating of albumen to their plates, for reasons which have been frequently given, and various ways have been adopted of applying the substratum. Some use a kind of brush of Canton flannel over a piece of glass; others pour it on whilst the plates are wet; and, again, others pour it on dry and guide it over. Thus we have open to us the traditional three courses insisted upon by a certain politician. But, whichever of these three methods may have been selected, a common agreement seems to have been arrived at that it is a *sine quâ non* that no albumen shall under any circumstances be allowed on the back of the plate, because it will fog the bath.

I remember reading in one of the journals the experience of an operator who inadvertently put some plates in his bath after coating with collodion the unalbumenised side. He described his bath as entirely out of order next day, although working well for a few hours after the mishap.

Finding the labour of wiping the superfluous albumen from the backs of plates very onerous, I thought I should just like to know what would be the effect of albumen in the bath. I therefore set aside one bath and six dozen plates prepared by pouring on albumen whilst the plate was wet, in all of which I was sure the albumen went over the back. I had a theory as to what the result would be, and it turned out just as I expected; contrary to what we have always been told—the albumen has no effect whatever.

Three weeks have elapsed, and about nine dozen half-plates prepared as stated have been through the bath of about eighty ounces, and it works just as well as ever—perfectly clear in the shadows and full of harmony and half-tone. The *rationale* is obvious: the bath is a strong one (forty grains), and at once coagulates the albumen, which becomes immediately innocuous. I can imagine that if a weak bath were used the results might be different, solution of the albumen occurring and organic disturbance being created.

It is, of course, possible that a simpler cause may exist for the non-effect of the albumen in the film being quite desiccated, and requiring longer for its solution than the time occupied in the bath by the collodionised plate.

Samuel Fry.

## ON THINGS IN GENERAL.

The event of the month, I think I am safe in saying, is the Exhibition of the Photographic Society, and it is accompanied, as is every periodical exhibition, by the same stereotyped question, as year by year it opens its doors upon its maiden freshness—"How does it compare with former exhibitions?" This serves to open the floodgates of criticism in the same fashion as the historical meteorological observation serves conversationalists. The question this year will meet with a fairly satisfactory reply. There are fewer exhibitors and fewer pictures; but, at the same time, fewer bad pictures. Many are elevated above the usual uniformity of mediocrity, and few fall below it; and, as the pictures are pretty well hung, there is little doubt that most exhibitors are dissatisfied. One important feature of these exhibitions is very conspicuous in the present one, and that is the increase in the number of large works. There can be little doubt that Mr. Crawshay's far-seeing and praiseworthy efforts to enlarge the sphere of our art, and to inculcate that greater freedom, and even "handling" we may term it, which the manipulation of large pictures helps to foster, is already beginning to bear fruit, as evidenced both in the number of works and in their execution and feeling. In years to come, unless I am much out of my reckoning, we shall see still further results of his munificent and really genuine patronage.

This is a class of work in which carbon printing is capable of putting forth its full efforts, and it has done so with advantage; witness the many examples of Messrs. Spencer, Sawyer, Bird and Co., the Woodburytype Company, &c., which are all very fine. If only a little more of that rich, juicy transparency so wonderfully attractive in a silver print could be imparted to them the days of silver would really be numbered. I should speak more exactly—I mean silver printing—or I shall have "J. S." down upon me. It really is surprising what an amount of prejudice against carbon printing exists in the minds of those—and they are many—who are ignorant of its details. One would have thought the time had gone by for anyone to make such silly suggestions as the correspondent named, of whom, by the way, one wonders how he obtained his information as to the amount of the hebdomadal consumption of the argentine salt. Another correspondent, "Canny Scot," would do well, after carefully laying to heart the Editor's advice, to take a trip to the Exhibition, and observe and make notes of all he sees; he must know that there is no royal road to art or any of its branches, and judicious posing is one, and a very important one. A worker with a real feeling for art will soon learn; and though of an artist as of a poet we may say "*nascitur non fit*," yet where the true artistic insight is wanting cultivation will do much. A careful study of such pictures as Mr. Faulkner's adaptations of a great master will do much to aid a diligent student; for he successfully produces a class of work which in ninety-nine cases out of a hundred is a miserable failure, deserving only the application of Pope's stinging satire—"Fools rush in where angels fear to tread."

Before dismissing the subject I must refer to the great pother caused by the "evening-dress" question. The photographic journals are not the place to discuss the ethical propriety of those canons of fashion that require a lady to cover her hands and feet and allow her to bare her arms and her bosom, for there is much to be said on both sides; and, when the old fathers of the church preached it to be "shameful and sinful that men and women in perfect health should cover their hands and their feet," I think a "Former Member of Council" is rather out of court in characterising Mr. Werge's remark as coarse and improper. As to swallow-tail coats, anyone who wears them much knows them to be the most comfortable attire possible in the heat of a crowded assembly. But, apart from this millinery discussion, the officials have made a mistake, for whatever be the future possibility in store for the Society it has not at present the status of those societies where such arrangements would be *de rigueur*. Its younger brethren outstrip it in real usefulness, and its own dignity has not yet recovered the severe compromise it sustained some time ago. The Council should undertake a work of real grandeur. I would suggest that the leading spirits produce a grand composition picture-subject—a following out of the suggestion in old Andrew Borde's lines:—

> "I am an Englishman, and naked stand I here
> Musing in my mind what raiment I shall wear"—

taking care not to follow too closely Lucas de Heere, who painted a naked man with different sorts of cloth lying about him; a pair of shears or scissors accompanied it, which might be introduced with appropriate suggestiveness.

I suppose the continued support of the *Athenæum* must have slightly turned the heads of the gentlemen composing the Council, for we photographers and our doings are now generally alluded to under their "Fine Arts" heading.

But this is the sea-serpent or gigantic-egg season, which is enough to account for many vagaries. I observe in that first-class periodical, *Nature*, a grave reproduction from a contemporary photographic journal explaining how a gentleman allows the sun to colour his peaches in patches by shading them with leaves, much wonder being felt at the result, quite forgetful that years ago the same idea was

elaborated in these pages to the extent of printing the owner's name upon his fruit by shading them with cut-out letters.

It is a little unfortunate for Mr. Tilley that in such a season he has introduced his patent combination negative process; for, whatever its practical capabilities may be, it is really one of the most ingenious processes that has been introduced for some time past, and I sincerely hope he may reap much pecuniary benefit from it. Another ingenious gentleman has, in a contemporary, done his best to take the wind out of Mr. Tilley's sails by saying he has invented a similar but better process, which he will either patent or give to the world without trammel; but the time fixed for the latter consummation is just after Mr. Tilley will have had to make up his mind whether to undertake the second expensive stage of his patent or no. The reader will be inclined to agree with me when I say that this is rather a tantalising way of putting the matter.

But with "Porte-Crayon," in this Journal, I feel the danger attending contact with processes. Already one knight is eager for the fray; but, instead of the fair weapons he speaks of, he throws a barbarian's weapon, a "stink-pot," inasmuch as he makes a false accusation of misrepresentation against me, though I had nothing but praise for his present efforts. If I made a cap it was a true fit for some one, and he has fitted it on himself. I was afraid another gentleman would be buckling his armour on anent the sweet-nitre-methylal question; but he has strong good sense, and the matter has subsided like other nine-days' wonders. Mr. Warnerke and the Editors having sent their little bantling into the world, Mr. Webster ill-used it and called it names, and got his face slapped for it; however, they have shaken hands all round, and the future must tell the fate of the interesting visitant.

Free Lance.

## A PLEA FOR THE USE OF A PRISM.

Attention has more than once been directed to the advantages to be derived, under certain circumstances, from the use of a prism placed immediately in front of the photographic lens; but, although I am aware of such a piece of apparatus being used occasionally by a few of my fellow-readers, I believe its capabilities or advantages have not been utilised to the extent their value might warrant me in anticipating.

During a visit to a friend who had just returned from a month's residence at the seaside I was shown a collection of pictures of a character I had never seen before, and which were so charmingly executed that I was tempted to inquire how my friend managed to produce such beautiful results, and of such apparently difficult subjects. The pictures might appropriately be called "seaside studies," not because they consisted of stretches of breaking waves or bits of rock-bound coast, but from the fact that they depicted in a charming manner marine, animal, and vegetable life in its natural element and in all its glorious beauty—a beauty in danger of being lost whenever the animal or vegetable is removed from its natural habitat.

I dare say there are few photographers who, when visiting the seaside, and while admiring the display of natural beauty to be seen in the numerous little pools left in hollows of the rocks by the receding tide, have not wished they could bring their cameras successfully to bear on the scene and transfer its beauty, in some degree at least, to the collodion film. I am aware that this has been frequently attempted; but until I was shown the collection already mentioned I had seen nothing that could be considered adequately successful in this direction. Here, however, we had before us a series of over thirty of those little pools, each an irregularly-shaped basin, the edges of which consisted of algæ-covered rocks, and each filled with a brilliant and exquisitely-arranged mass of both animal and vegetable life. Especially beautiful were the various anemonæ in all forms and sizes—some as a round ball, more like a pebble than an animal, while others, with their antennæ or feelers all spread out, looked like brilliant flowers. Not less beautiful were the various plants, the most delicate structure of which was finely rendered. The whole, in fact, formed a study not only most charming to look at, but one that must be thoroughly available for educational purposes, the only thing wanting being colour to bring the wonders of the seashore to our firesides.

In answer to my inquiries as to the mode by which the pictures were produced I was informed by my friend that on several previous occasions he had tried to photograph the inhabitants of the pools with dry plates, but had met with very little success, the almost constant motion of some of both the plants and animals making a very rapid process imperative. In working wet collodion serious mechanical difficulties had been encountered, to remedy which he had this season, before leaving town, got a prism constructed, so that the camera might be retained in its ordinary position, and to that arrangement he attributed the large measure of success he had secured. The prism was of ordinary flint glass, about an inch and a-half in length and of the same breadth on each face, and having one of the faces covered with black varnish. It was fastened to a piece of brass tube, which fitted the hood of the lens, and could be easily moved or placed at any desired angle. In reply to a question as to the absorption of light by the arrangement he maintained that it certainly was not more than twenty per cent., and stated that some of the pictures were taken with an exposure of not more than five seconds. Whether or not my friend is correct in attributing his success to the use of the prism I cannot certainly say; but there can be no doubt of his having produced some very fine pictures of most difficult subjects—pictures not only very much out of the beaten track, but possessing a value, as I have already said, for purposes of instruction altogether independent of their beauty.

I was, at the same time, shown a series of excellent negatives of ornamental ceilings in the best style of Italian art of the seventeenth century, which my friend declared could not have been obtained—or, at least, with anything like ease—without the prism; and so enthusiastic is he in its favour that he declares that in future he shall never go on a working excursion without his prism.

John Nicol, Ph.D.

## THE NEW STUDIO WINDOW.

[A communication to the South London Photographic Society.]

Wherever I have visited the studios of photographers I have generally been placed in the centre of the room and challenged to admire the quantity of light there thrown upon me; but when I placed myself at either end—in front of the background and in the position of the sitter—it has always struck me how little of the light entering the window fell upon me or illuminated the background, and that the light was actually wasted throughout the length and breadth of the room. Consequently, when I was asked my opinion in regard to the best form of studio, I was quite at a loss; for, though I had seen a great variety of construction while visiting the studios in the North, Far West, and South of America, in Turkey, the heart of Russia, or the rest of the continent, and even here in the centre of civilisation, I had nowhere met with one which showed a thorough understanding of the proper direction of light and how to obtain it.

In looking over what had been done I found there had been suggested a very ingenious plan which threw the light towards one end of the room by placing the glasses at different angles facing the sitter; but it has never been adopted, for the very good reason that it confined the sitter to one end of the room and interfered with the space necessary for the operator and the camera, besides introducing many other disadvantages, not the least of which being that there was no reflected light possible in the room. I hold that a perfect studio should enable the photographer to have both ends of the room illuminated at once or not, just as he pleases, in order that he may have every possible opportunity for experimenting with every variety and direction of reflected light, as well as to be able to shut off that part or all of the light which does not assist in directly illuminating the sitter, and which he may consider injurious.

Another photographer introduced swinging blinds which would cut all light off from the camera end of the room. This plan was not adopted, because merely cutting off light from one end is not gaining light at the other, and when general illumination of the room was desired the blinds would have to be taken down.

It is found that by causing the sitter to recede toward one end of the studio a better direction of light and most room to work the camera is obtained. Unfortunately, in proportion as the direction of the light thus obliquely reaching him is improved so does its quality deteriorate on account of the reflection and absorption it suffers in passing through the glass at angles of incidence more and more acute.

In Brewster's treatise on *Optics* a table of reflection is given by M. Fresnel. According to this the amount of light reflected from ordinary window glass at the angle of incidence of 40° is 49·10 out of 1,000; at an angle of 56°·45′ it is 79·5 out of 1,000; at 70° it is 162·67 out of 1,000; at 80° it is 391·7 out of 1,000; at 85° it is 616·28 out of 1,000—thus demonstrating that over half the glass is absolutely useless in transmitting light direct to the sitter.

Another great obstruction is observed by the sitter in the increasing width or side view of the sashes as they recede from him, and, as in this climate we have less good light than in any other, we cannot afford to lose the smallest amount. I have observed that in England there are many days which must be very aggravating to

photographers, for the light is just good enough to take a good picture out of doors or without any window, but in even the best glass house it was impossible. Some photographers have so constructed their window that they can swing a section of it open, thus admitting the pure light. The objections to this are very evident. Dull weather is too often accompanied with rain, wind, or cold, while soot, smoke, or fog are decidedly objectionable in the room.

To construct a window which will concentrate and throw the purest and clearest rays of light obliquely towards the two ends of the room, and which will avoid all the inconveniences and objections referred to, has been my aim; and, after explaining to you my invention, I shall be pleased to answer any questions or discuss any point with you.

Since the first studio was built on my new plan several important improvements have been introduced, which will be found in the last one built, viz., at Signor Lombardi's London establishment, 13, Pall Mall East. By arrangement this studio is permanently thrown open for the free inspection of the profession between the hours of half-past eight to ten o'clock each morning, and from four to six o'clock each evening. [Mr. Vander Weyde then gave a concise explanation of his new system of construction, for the details of which we must refer our readers to the number of the Journal for August 20, page 398.]

I particularly wish to dissipate a misunderstanding which I have found lately existing. I repeat that I do not depend upon blinds or shades for concentration of direct rays of light, and that when all the blind cords are let loose and each spring roller-blind rolls up and out of the way both ends of the room receive uniformly direct, unobstructed light throughout the entire breadth of the window, the quality of this light thus thrown on the sitter being practically the same as that obtained when opening or taking away the entire window. The new construction introduces numerous other advantages never before obtained. By glazing alternately with glass of a yellow tint one end of the room receives a pure warm light, the other end a comparatively cool light—a great advantage to painters, who can place their object or figure in warm light while their canvas and paints are always in a cool light, the light in the middle of the room being neutral.

Perfect ventilation, the most singularly-complete control, and its novel and symmetrical appearance makes this studio an object of comfort, interest, and pleasure to the public as well as to the artist.

HENRY VANDER WEYDE.

## FOREIGN NOTES AND NEWS.

A NEW USE FOR COLLODION.—IMPROVEMENT IN ELECTRIC LIGHTING.—A WORKSHOP LIGHTED BY ELECTRIC LIGHT.—ANILINE DYES WITHOUT ARSENIC.—A TEST FOR BEER.—A SIMPLE ENAMELLING PROCESS.

COLLODION has long enjoyed the distinction of being considered the best medium for the delineation of astronomical and other scientific observations by means of light, and its scope of usefulness in connection with physical investigation has been still further extended. In the *Archiv* Dr. Schnauss says that for some years he has used small bags prepared from thick collodion in his dialytic and endosmotic researches, and that, latterly, Herr Grippon has employed the collodion film peeled off clean glass plates in his experiments with polarised light and the radiation of heat. The collodion film polarises reflected as well as transmitted light, provided the thickness of the skin be, by exact microscopic measurements, between 0·0081-0·0088 millimetres, in which case the angle of the greatest polarisation would be = 38° 55; its reckoning index = 1·5108. The skin allows 0·91 of the heat radiating from a luminous source of heat to be transmitted, while a darkened vessel with boiling water only allows 0·70 to pass through; but if the heat radiating from the water be but 50° then only 0·50 passes through.

From this it will be seen that the radiation from a vessel producing 100° of heat, when transmitted through two superposed collodion skins, still retains 0·583 of heat. Further: the greater transparency of collodion renders it a suitable substitute for mica in producing polarisation, and the ease with which it can be prepared counterbalances the greater durability of the mica, and its great dia-thermometric powers recommend it as a vehicle for experimenting upon the radiation of heat.

The current number of the *Photographische Correspondenz* says that some time ago the Imperial Academy at St. Petersburgh awarded the Lomonossow prize to Ladyguine for important discoveries in the direction of illumination by electricity. The Director, in presenting his report, remarked that since (in 1821) Davy discovered the voltaic arc, this, the most brilliant of artificial lights, has often been turned to practical account; but, as yet, obstacles have always come in the way of its continuous use. In spite of complicated regulators for the movement of the consuming carbon poles the strength of the electro-carbon light remains subject to sudden change. Besides, for ordinary lighting purposes—to replace lighting gas and lamps—it is too harsh, and it appears to be impossible to dilute it through a number of less harsh luminous points; and, lastly, the method of generation, by means of galvanic batteries, is too expensive.

In recent times, however, it is possible to produce, by means of electro-magnetic machines driven by steam power, an electro-carbon light of equal strength and at a third of the price of gaslight; and were the tension doubled, in order to make it more equal, the desired less harshness of illumination would be attained. Some adaptations of electric light in Geissler's tubes have proved too weak and variable, but that of Ladyguine has attained better results. It is universally understood that the electro-carbon light, depending upon the peculiarity of the heated conducting electric stream, increases with the resistance offered to it. Thus the high illuminating power of the electro-carbon light originates partly in the badly-conducting layer of air situated between the carbon poles, which becomes intensely heated and contributes to the combustion of the white-heated carbon points. On account of the great resistance which this layer of air opposes to the conducting it can only be overcome by a very strong stream of electricity. For example: it would be sufficient without the assistance of a gas to bring a solid body, such as platinum wire, to melting point. This light is weaker, more equal, and more under control—allowing itself to be increased or decreased at pleasure. It has not come to be used practically, as it is too costly and the platinum is apt to melt.

From this the idea of covering the platinum with a coating of carbon almost like graphite, and adding a good conductor, occurred to Ladyguine. At an equal temperature the carbon has a much greater radiating power than the platinum, and the capacity for heat of the latter is almost double that of the questionably good conductor, the carbon, so that at the same heat the temperature of a small stick of carbon rises to almost twice as high a degree as that of a platinum wire of the same volume. Besides, the resistance of the carbon to the passage of the electric current is some 250 times greater than that of the platinum, and the carbon can also be fifteen times as thick as the same length of platinum wire, if the electric stream passing through it is to contract the same amount of heat. Lastly: there is no fear of the carbon melting; therefore the method of electric illumination proposed by Ladyguine recommends itself as practicable. The only objection to it, namely, that the carbon always combines with the oxygen of the air and burns, has already been overcome by the inventor. He isolates the carbon in a small glass tube, from the interior of which the oxygen is easily excluded.

A recent number of *Les Mondes* gives an account of the way in which M. Heilmann Ducommun has succeeded in lighting his foundry, which is 220 × 110 feet, by means of four electric regulator lamps placed one at each corner of the building. When all four lamps are lit one can read small print in any part of the building. Each lamp is connected with a separate electro-dynamic machine driven by the steam engine belonging to the works. The cost of lighting is 0·04 francs per hour, exclusive of the interest on the original cost of fitting up the apparatus.

The same journal mentions that a method of manufacturing aniline dyes without arsenic has been adopted by the Aniline Dye Manufacturing Company at Tournay. The colours so obtained are very pure and suitable for many purposes for which the arsenical aniline dyes are quite unsuited.

In working the beer and albumen process the amateur often obtains quite unexpected and not altogether welcome results, though he has closely followed the instructions:—Take so much beer. But there are beers and beers, and it is not to be expected that new and old beer would act in exactly the same way. Herr Kral contributes the following test for good sound beer to Stummer's *Ingénieur:*—To sixteen parts of the beer to be tested add one part of a solution of neutral sulphate of iron of 20° Baumé. The beer at once becomes muddy; but after standing from a quarter to half-an-hour good, old beer becomes clear and the sediment falls to the bottom. Newer beer settles more slowly in proportion to its newness, and very new beer never becomes so clear and pure as the old.

M. Jean Englemann, the inventor of chromolithography, has just died at Paris at an advanced age.

A simple means of enamelling *cartes* is given in the *Journal de Photographie.* A clean glass plate is collodionised, washed, drained, and flooded with a weak solution of gum carefully filtered. The print is laid upon the gummed surface and air-bubbles removed by means of a squeegee; the glass carrying the picture is then placed under pressure in a printing-frame until dry, when by cutting round the edges of the print it may be stripped from the glass with the greatest ease.

## ON ART IN PHOTOGRAPHY AND THE LATE O. G. REJLANDER.

[A communication to the Manchester Photographic Society.]

In the year 1865, soon after I commenced taking photographs, I met Mr. O. G. Rejlander, who was on a visit to Bowdon, and was introduced to him. I offered him the use of my gallery and dark room, and a photograph I have brought with me will show you how he used the former. In that corner, which I covered for him in the way you see, he took as good pictures as any I have seen of his. He remained at Bowdon about a fortnight, and I had thus the coveted opportunity of becoming acquainted with him and of seeing by what means he obtained the pictures which at that time had made his name well known to lovers of photographic art.

No doubt some of those present will recollect some of his pictures at the Art Treasures' Exhibition. One of them—a large composition picture, called *The Two Ways of Life*—I present to your notice this evening. It was, I think, taken at the suggestion of the late Prince Consort, who, at that time and until his decease, maintained friendly relations with Mr. Rejlander. The last portrait taken of the Prince was by Mr. Rejlander, prior to the development of the fever which ended his life. He left on Mr. Rejlander's mind a very pleasant recollection. He always spoke of the Prince Consort with respect, and told many anecdotes of his photographic intercourse with him illustrative of his genuine princely character.

Mr. Rejlander was an artist before he became a photographer, and was both a painter and modeller. He had studied anatomy carefully, and was master of all it can tell an artist of human form and action. He had also travelled in Spain and Italy, and had carefully educated himself from attentive study of the great masters, whose works are the classics of European art.

Not many years ago a very delicately-painted child's head by Mr. Rejlander enjoyed a good place in one of the Royal Academy exhibitions, and bore comparison favourably with all that was best about it. A well-known artist assured me that Mr. Rejlander could never have been an artist or he would never have been a photographer; but artists as able to whom I have shown his pictures have recognised at once the true artist's work. How a man like Mr. Rejlander came to be a photographer I cannot say; for it was not only that he could paint well, that his eye felt intensely the influence of form and colour, but there were more than these qualifications for the artist in his nature. He had a keen sympathy with human life, and a genuine love of nature. No mood of either escaped his observation. He had himself felt the vicissitudes and the conflicts of life. He had tasted both its joys and its sorrows; but, though he had difficulty in earning his livelihood, yet he passed through life with his spirit unsoured, and nothing could destroy to the last the childlike simplicity of his spirit. He was young, even when disease had reduced him to a skeleton and life was only suffering to the body. Wherever he was known he was loved, and whatever he took in hand he did well. His volunteer comrades raised him to authority in the ranks, and he won distinction amongst them as a marksman. His funeral was conducted with military honours.

The true artist, whether of the brush or pen, belongs to no sect or clique, and Mr. Rejlander belonged to none; you could not have enticed him into any wrangle or gossip, and his name never figured in any party strife. He felt those touches of nature which make "the whole world kin," because we are all human alike. He had the capacity and the heart to sympathise with all, and this, united to the power of making it vocal in pictures, or poetry, or prose, is one of the marks of genius.

Such and much more was the man I have undertaken to speak about tonight. I am only sorry I am not more competent to do justice to his memory; for here I must say that I am not an art-critic so much as one who has always felt the true and beautiful without analysis. I have the misfortune to be colour blind, to wander in hopeless helplessness amongst reds and greens; yet, for all this, a picture which is not true in colour offends my eye without my being able to say why it does so. I can more readily find out wherein drawing offends; but criticism, like everything else, is an acquirement only attained by study and analysis. I know I shall be sadly at fault in pointing out the excellences or defects of the pictures I have brought here tonight. They are not *my* selection, and I do not think they do full justice to Mr. Rejlander, as there are many I know of which are not here; but I have had to take what have been sent to me.

The first picture I will allude to is *Young Photography Handing the Artist a Brush.* Any photographer will at once wonder at the production of such a picture by means of the camera. No part of it is neglected. Hands, feet, form—every portion is studied with the greatest care and delicacy of feeling. It also expresses an idea of Mr. Rejlander's, for he felt how defective a photograph must be as a work of art when compared with the work of a painter or sculptor.

The hand of the artist holds many brushes; young Photography—only a child in fact—gives him one more. This idea is conveyed in a picture well calculated to show that as Photography grows the brush may be used with power. Paganini could play upon one string, but no man knew better than he the value of four; and so with any man who has tried to make a picture by means of the camera alone. If he have any sense of what a picture should be he will feel, just as he is master of his one brush, the defects of his means for attaining the highest results. A great picture cannot be produced by the camera alone. Mr. Rejlander knew this very well, and with him the camera was but *one* brush, and a very inadequate one, for expressing what he wished to convey. But still, though it is not everything, photography has done good service to art, and it has effected much in the way of artistic education.

Such a power as the camera was destined from the first to be used, and its productions to become familiar to us all. That they should be good, therefore, was always of the first importance; and if all artistic feeling had been withdrawn from it, and all artists had despised it, the world would have been poorer than it is. It has made us all familiar with countries and with life we could not otherwise have known so well as we do. The lineaments of great men are known to us all as the faces of friends, and its truthful delineations of the features of those who are dear to us and of many whom we shall never see again have made the discovery of photography one of the great blessings of modern times.

No doubt it was in some respects a pity that a genius like Rejlander should have devoted himself to photography almost exclusively; but the new art needed such devotion, and it would be ungenerous not to recognise the service rendered to it by the man whose love of art induced him to dedicate his life, not to making money by it, but to showing how it could be raised to a worthy place, made to awaken sympathy with beauty or with suffering, and to serve as an educator of national taste.

Mr. Rejlander took a portrait of me, and coloured it on the albumenised surface of the paper. I have no other specimen of his work in colour to show, but have brought this, as it gives some notion of his work as a painter. Mr. Rejlander was, I believe, the first to produce in a photograph those effects of light which are now so common in what are called "Rembrandt" photographs, some of which are so devoid of natural beauty and are mere tricks of lighting or retouching. He never "rode a hobby to death," and in all his pictures where this effect has been produced you will notice that he is careful "not to o'erstep the modesty of nature." I have seen a great many of Mr. Rejlander's photographs, but I never, save in one instance, saw a picture repeated. However successful he might be, he seemed to possess such endless fertility of resource that he did not feel the need of repeating it again. He had no *repertoire;* nature afforded him variety. This was the result of an eye that saw beauty everywhere and in all manner of places. This quality in Rejlander was another mark of his genius.

In painting or in sculpture the artist can produce a perfect result. Sculptors and painters present us with forms more perfect and beautiful than any which exist in nature. Every part of a figure can be made perfect by study and care; but this is not so with photography, which can only be made to yield the best of that which is. A photograph, therefore, must be criticised under different canons to those by which we judge of a painting. It is seldom, if ever, that a photograph can be perfect, and the more the parts it has the less is it possible that it should be so. It is more likely to be perfect just in proportion to the simple character of the subject. A face may be beautiful, but is seldom perfect; but an eye, a forehead, a nose, or an ear alone may often be faultless in form, and so throughout the figure. When we come, however, to grouping more figures than one or two, or deal with the nude form in photography, the chances of failure are very much increased. In *The Two Ways of Life* Mr. Rejlander attempted far too much, and as a picture it is full of the gravest defects. It is not within the province of photography to realise such a conception.

Still in most of Mr. Rejlander's pictures it is remarkable how many perfect parts there are in each. Sometimes he would keep a photograph in almost all respects bad for some one excellence. A photographer can hide defects by careful posing, and of one face make many different pictures. Note *The Sweep's Wife* and a large sleeping head. Both are from the same model, and the tall form in one called *Hope* is also from the same. Observe not only the whole picture, but also the parts, for Mr. Rejlander saw all. You will generally be able to discover what is good in something that, as a whole, does not please. Many photographs please as a whole, but will not bear analysis—more especially photographs of figures. But what beautifully drawn hands and feet you may meet with constantly in Mr. Rejlander's photographs! Mr. Rejlander was full of humour. *Mother Goose—Remarkable! I*

*Have Lost My Pen, and Now My Spectacles are Gone!—She's Looking at Me, the Dear Creature!* are perfect in their way. The last is a wonderful picture, as is also *The Winking Virgin*, &c. In his pictures of London street boys we have both humour and pathos combined. In them the photographer claims kindly sympathy for the victims of misfortune and neglect. Notice *A Street Arab.* Why photograph those features and rags? Not certainly because they are beautiful. *Adding Insult to Injury*, and *Jim! Is it a Good Un?* are full of life. The *Song Without a Shirt* and *Homeless* are inexpressibly sad. All these pictures appeal to us to pity and help, and not to pass by on the other side. I do not know of anything in photography that approaches so nearly to what we call a picture as some of these photographs. I know of cleaner and sharper photographs, and more momentarily striking, but of none which will bear thinking of so well from many points of view.

To produce pictures by means of photography is a slow process. A slow process means expenditure of time, and in England time is money. Mr. Rejlander knew how to take a sharp and clean photograph as well as anyone; and I have heard him say that he knew what would *pay* best, but that he could not do it, as he felt it would be degradation and a dereliction of duty to pander to what he thought to be untrue. So he preferred being poor, if that must be the penalty for being true to art. He, therefore, did not try to turn out the greatest number of pictures so as to get in return the most money, but would study his subjects with care, and work at them for hours, in order to produce the best he could. His plates would get dry and spoiled just as what he wanted was found, and then he dare not miss seizing the fleeting form on anything he had by him; hence defective negatives only too often from a purely photographic point of view.

Some may think that in all this Mr. Rejlander was Quixotish; but we may very safely say that had he not been so, though his pocket would have been enriched, it would have been worse for art and for us. Men who take Mr. Rejlander's view of duty in life are not plentiful, but they are the great ones of the earth, however lowly may be the vocation in which they work.

A long and painful illness confined Mr. Rejlander to his room almost entirely for many months before he died. He literally starved to death. He could not earn money, and the expenses of his illness were such that he wrote me saying how slowly he was dying and how expensive it was to die. Considering this, Mr. Rejlander did not die owing much—not as much as he must have lost during this distressing period. When he died his widow was left unprovided for, and a fund has been started by some of his friends in London in order to assist her to begin and work for herself.

My duty is done now that I have told you what I know to have been true of a brother in our art—of one whose genius and excellence shed some lustre on the profession. If out of love for what was worthy and great, and gratitude for a well-spent life, any of you incline to send something to the fund for helping Mrs. Rejlander you will do that which would have pleased him most, and what he would bless you for could he know of and acknowledge his gratitude for your approval.

J. B. Forster.

## PHOTOGRAPHY IN COURT.

### A SINGULAR ACTION.—SANDYS *v.* DEAN.

This was an action brought in the Southwark County Court, on Friday, the 15th inst., before the judge, F. Dasent, Esq., in which the plaintiff, an independent gentleman residing at Stamford-hill, sought to recover the sum of £5 under somewhat singular circumstances.

The solicitor for the plaintiff said that his client had entrusted to the defendant a daguerreotype portrait of his late mother to be restored and an enlargement made from it. The defendant having kept the portrait for three months in his possession the plaintiff applied for its return, together with the enlargement he had ordered, when, after further delay and on a second application, the defendant returned the daguerreotype, but in such an obliterated condition as to be barely discernible, and as he (the defendant) would not make any compensation the plaintiff brought the present action for the loss he had sustained.

The plaintiff, on being called, corroborated his attorney's statement, adding that he would not have taken any money for the portrait of his late mother, only bringing the present action upon public grounds, and to teach a lesson to photographers to be more careful of the property entrusted to their care. In the present case the loss was irreparable.

In cross-examination by the defendant's attorney the plaintiff admitted that the intrinsic value of the daguerreotype might have been about ten shillings, and that he might as well have sued the defendant for £500 as for £5; he only brought the present action upon principle.

This being the plaintiff's case the defendant was called, who stated that the original picture was so faded that it was scarcely perceptible, and that he took the usual means to restore it, but without avail. As he could not reproduce an enlargement from it he returned it to the plaintiff.

At the request of the judge the daguerreotype was produced in court, when no trace of lineament could be seen.

The defendant stated he had done nothing whatever to injure the portrait, but had taken unusual care with it.

This being the defence, the judge remarked that no plaintiff could recover the amount of any fancy price he might put upon an article, and in this instance the plaintiff admitted that he might as well have sued for £500 as £50, therefore his claim must be disallowed; still, as the plaintiff acknowledged that the intrinsic value of the daguerreotype was about ten shillings, he thought he was entitled to recover on that amount. Judgment would therefore be entered for that amount, but the plaintiff's costs would be disallowed.

# Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

| Date of Meeting. | Name of Society. | Place of Meeting. |
|---|---|---|
| October 26 | Liverpool Amateur | Free Library, William Brown-st.. |
| ,, 28 | Oldham Photographic Society.. | Hare and Hounds Inn. |

## SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The first meeting of this Society for the present session was held on Thursday, the 14th inst.,—the Rev. F. F. Statham, M.A., President, in the chair.

The Chairman expressed a hope that in the current session members would come forward with brief papers. He wished it to be understood that long and formal papers were unnecessary, short ones very often suggesting themes stimulative of interesting discussions.

Mr. Vander Weyde then read a paper on *The New Studio Window.* [See page 511.]

The Chairman having thanked Mr. Vander Weyde for his paper,—

Mr. Ayres inquired whether the system advocated would be applicable for the taking of groups as well as for single sitters, because it seemed to him that, owing to the light being strongest in the centre, those portions of a group placed at the side would be imperfectly lighted.

Mr. Vander Weyde explained that there was no difference in the strength of the light within two or three feet of the sitter.

Several other questions were put and observations made by Mr. Jabez Hughes, Mr. Spiller, Mr. Fry, Mr. Wilkinson, and others, to which Mr. Vander Weyde replied by drawing certain diagrams on the black board, without which illustrations his remarks would not be properly understood.

Mr. Samuel Fry then read a paper on *Albumen and the Nitrate Bath.* [See page 510.]

In reply to a question put by Mr. Spiller,

Mr. Fry said that his nitrate of silver bath never became discoloured by the presence of albumen.

Mr. J. T. Taylor observed that in the albumen process on glass the bath became of a deep brown colour, and inquired if Mr. Fry could explain the cause of the exemption of his bath from such discoloration.

Mr. Foxlee remarked that in the albumen process not only was there the deep discoloration mentioned, but it occurred with a bath of much greater strength than that employed with collodion.

Mr. Fry was well aware of the fact, but he was unable to offer the desired explanation.

Mr. Wilkinson found that when plates coated with albumen were damp they frequently fogged; but if the albumen were rendered quite dry no fogging occurred.

Mr. Jabez Hughes explained that the fogging was owing to the action of the nitric acid on the attenuated film of albumen. Soon after the introduction of the Taupenôt process he had tried albumen in the bath under extreme conditions. Delighted with the fine, rich tones obtained by that process he gave his plates a coating of albumen, followed afterwards by one of collodion; but after a few days fogging resulted, obliging him to prepare a new bath every week, which, in consequence of the beauty of the results obtained with albumen, he willingly did for a time, but he eventually discontinued the practice.

Mr. Fry said that in his case the albumen film was very attenuated and quite dry; the proportion of acid in the bath, too, was considerable. At occasional intervals he boiled his bath.

A vote of thanks was awarded to Mr. Fry, and after a few further remarks the proceedings terminated.

## MANCHESTER PHOTOGRAPHIC SOCIETY.

The annual meeting was held at the Memorial Hall, on Thursday evening, the 14th inst.,—Mr. W. T. Mabley, President, in the chair.

The minutes were read and confirmed, and the Secretary read the—

### ANNUAL REPORT.

The session of 1875 closes the twentieth year of the existence of the Manchester Photographic Society, and your Council hope and have reason to believe that during the twenty years of its active life it has been instrumental in forming many lasting friendships, and productive of some photographic benefit to its members generally.

The past year has not been distinguished by any special feature, and the Society may be said to be in about its normal state. While a slight improve-

ment has manifested itself in one direction, a little falling-off has been apparent in another. But so it must ever be; and your Council can only make the best of the circumstances in which they may find themselves placed. There are at present 77 members on the register, and two nominated for election, against 76 members at the last annual meeting; but the average attendance during the year has been only 28 against 31 in the year just completed.

Although the papers contributed during the session have been but few, the meetings have been far from uninteresting or uninstructive, and this is, no doubt, a matter for congratulation.

The President read a new paper on a good old subject, *Printing by Development*, illustrated by an exhibition of the process.

Mr. John Brier, jun., read a paper on *The Production of Enlarged Landscape Negatives*, with illustrations.

Mr. A. Brothers, F.R.A.S., explained in what way the photographic methods had been utilised during the transit of Venus, illustrated by numerous diagrams.

Mr. Noton read a paper *On the Manufacture of Nitro-Glucose*, followed by a supplementary statement and experiment at a subsequent meeting.

The active session closed with a lantern exhibition of choice pictures kindly lent by Mr. F. York, of London.

Your Council, in thanking those gentlemen who did their best for the Society last year, beg to express a hope that they will renew their efforts in the year to come, and that many other members will follow their very good example.

The annual report was accepted, and Messrs. Jas. Young and Wm. Cleary were elected members of the Society.

The following gentlemen were elected to fill the various offices for the year:—*President:* Mr. W. T. Mabley.—*Vice-Presidents:* Messrs. A. Brothers, F.R.A.S., M. Noton, Thos. Haywood, Rev. Canon Beechey, M.A., and Mr. G. T. Lund.—*Council:* Messrs. Jno. Brier, jun., W. G. Coote, A. Coventry, John Holding, A. Paterson, J. B. Payne, I. Wade, John Warburton, N. Wright, and J. C. Sewell.—*Treasurer:* Mr. J. H. Young.—*Secretary:* Charles Adin, Clifton Bank, Wellington-road, Whalley Range, Manchester.

Mr. J. B. Forster read an interesting and instructive paper *On Art in Photography and the Late O. G. Rejlander* [see page 513], illustrated by some of the works of the deceased artist.

The Secretary laid the *Bulletin* of the Belgian Association of Photography on the table, and collected the sum of £6 12s., which he hoped to make up to £7 12s., towards the fund in aid of Mrs. Rejlander.

The meeting was then adjourned.

# Correspondence.

## ALKALINE GOLD TONING, &c.

*To the* Editors.

Gentlemen.—On referring to a paper I read before the London Photographic Society in 1857, I find that the originator of the *alkaline* chloride of gold-toning process was Mr. Waterhouse, of Halifax. This gentleman sent a specimen print to the committee appointed by the Society with a request that its permanence might be tested. It was a plain paper print, and carbonate of potash was the alkali employed. Mr. F. Frith, of Reigate, was the first to carry out the process on a large scale, and to use it with albumenised paper.

In the notice of my own labours in connection with photography which you kindly gave in your last issue mention is made of a private letter written by me to the Editors. I may remark that such letters are often written in haste, and that I am not prepared in this instance entirely to endorse what I said. I was, however, unfortunate in this respect—that I never saw in print any acknowledgment of the value of my papers on collodion; nor any allusion to them at all further than that the whole subject was still involved in great obscurity, and had made little or no progress since Archer's day.—I am, yours, &c.,

*Shotton Vicarage, October* 18, 1875. T. Frederick Hardwich.

## CANON BEECHEY'S DRY PROCESS.

*To the* Editors.

Gentlemen,—I thank your correspondent, "Old Amateur," for affording me an opportunity of explaining the approximate proportions of bromide and silver in my formula. The difficulty I found was what I stated in my private letter to you, viz., in estimating the difference in the quantity of effective bromide between commercial and anhydrous bromide of cadmium.

If commercial bromide of cadmium could be relied on as the same in every sample (which I have never found to be the case), the proportions I should have given for the bromide solution would have been 320 grains to eight ounces of absolute alcohol. Instead of this I allowed 300 grains (five drachms) of anhydrous bromide as about equal in strength. This would allow forty grains of commercial, or thirty-seven and a-half of anhydrous, to the ounce. But it will be found that ten grains of bromide of cadmium deposit in solution about two grains of insoluble powder, leaving thirty-two grains instead of forty to the ounce of solution of effective bromide.

My note says if commercial bromide be used thirty-two grains of nitrate of silver will be enough for the half-ounce of solution containing sixteen grains of effective bromide; but I prefer forty grains if anhydrous bromide be used. The proportion should be two grains of silver nitrate to one grain of *effective* bromide. Let "Old Amateur" try the two proportions of thirty-two and forty grains of silver, or use the commercial bromide of cadmium if he can procure a good sample. The advantage of a stock-bottle containing eight or more ounces consists in the uniformity of the emulsions made from it.

As regards the quantity of acid, two drops are ample for every eight grains of bromide and sixteen grains of silver; and, as regards the quantity of emulsion resulting from the quantities of ether and alcohol given, it scarcely exceeds two ounces in all. Of the ounce used to dissolve the silver a good deal evaporates in boiling and pouring out; some of the silver also crystallises on the flask. But really the essential qualities of a smooth, round, creamy emulsion will be obtained by using the proportions I have given, viz., one ounce of ether, half-an-ounce of bromide solution containing sixteen grains of effective bromide, and thirty-two or forty grains of nitrate of silver dissolved in one ounce of alcohol (·820) by heat.

Twelve grains of *soluble* gun-cotton are quite enough for the above proportions in the collodion. If "Old Amateur" would like a smaller proportion of alcohol, forty grains of nitrate of silver *will* dissolve in seven drachms of alcohol (·820); but it takes a little longer, and the evaporation causes a very saturated solution, which is apt to crystallise on cooling. Will he be good enough to try my formula as he finds it?

Since writing to you I have taken some negatives of the *Ruins of Castleane Abbey*, which I will send you as soon as I have printed from them. I think you will say they have all the bloom by reflected light of first-rate wet plates, and by transmitted light are as dense, clear, spotless, and full of detail and half-tone as you could desire in a dry plate. When you have examined them please forward them to my old friends, the Manchester Photographic Society.—I am, yours, &c.,

*Hilgay Rectory, October* 18, 1875. St. Vincent Beechey.

## CARTES.

*To the* Editors.

Gentlemen,—For a long time past I have been desirous of asking you to allow me, through the medium of your valuable Journal, to make a suggestion or two, but have waited thinking I should like to read it as coming from a more able pen than mine. But as no one seems to broach the subject, I feel I cannot allow it to remain unnoticed any longer.

It seems strange to me that of all the great and wealthy admirers of our beautiful art not one thinks it worth his while to endeavour to raise the standard of our *carte-de-visite* portrait by offering prizes for the best productions.

Now, I think a great mistake has always been made at our exhibitions in entirely ignoring the existence of the *carte de visite* by not giving a few medals or suitable awards to this size of picture. It has been, is, and, I venture to predict, will be the photograph of the day. No matter how perfect our enlarging processes, or how well we can produce large work, the public will *not* have them only in exceptional cases. Why, then, has this branch been entirely overlooked or forgotten, and preference and encouragement given to that for which there is the smallest demand?

I am quite sure that nineteen out of every twenty photographers have not been able to show what they can do, or compete with others at exhibitions, simply because they had not lenses to produce the size required. How many have a lens to take a 15 × 12 portrait, a 12 × 10, or even a whole plate? If they have the lens, have they the glass room suitable for such portraits? If they have both, how many can spare the necessary time to do them properly?

You, or some of your readers, may urge that medals or prizes have been given for enlarging, and of course the best *carte* negative would, in most cases, produce the best enlargement, so that, indirectly, they have been encouraged. This I admit; but then photographers who have their living to get by their profession cannot spare time to make experiments in enlarging, though they may have excellent facilities and possess abilities for so doing.

Then what I would suggest is this—that a special exhibition be held for *carte* and cabinet sizes of portraits, with an entrance fee of say five or ten shillings for each case exhibited, the cases not to exceed a given size, to hold only a certain number of portraits, and the entrance fees to form prizes for the successful competitors.

I would also like to see the operator's ability recognised in some form or other. To meet this, then, I would further suggest that bronze medals, or even certificates, be awarded to the operators who have produced the successful pictures, and, of course, something of more value to the employers. This, I believe, would induce all to do their very best, and so improve the quality of our pictures. I do not think I am alone in wishing to see the services of the operators recognised; and I am sure there are hundreds, like myself, who would like to know who are the best photographers in the United Kingdom, who would try and imitate their work, and improve upon and beat them.

Trusting you will find room for this, and that in your next issue a few others will give their opinions on this subject,—I am, yours, &c.,

*Bournemouth, October* 16, 1875. Geo. Nesbitt.

## EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at the small cost of one shilling in our advertising pages. This column is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

A whole-plate bellows camera, nearly new, in exchange for Cussons' posing-chair.—Address, H. Dunbar, 74, Paradise-street, Liverpool.

A Waterlow lithographic press, complete, will be given in exchange for a good cabinet lens. (See advertisement.)—Address, 11, South Bar, Banbury.

A quarter portrait lens, by Alex. Gaudin (No. 9,397), also a small view lens, will be given in exchange for a rolling-press and medallion stamp.—Address, Nichols, photographer, Canterbury.

A gallon copper still with furnace complete, or a Gothic table quite new, suitable for the studio, offered for a first-class half-plate lens.—Address, P. H. D. B., 17, Wolverton-road, Stony Stratford, Bucks.

I will exchange a pony, harness, and dark carriage, all in capital condition, for an enlarging and copying camera and a Dallmeyer C lens. Difference adjusted.—Address, Mr. Lux, High-street, Bracknell, Berks.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

*** Owing to the continued pressure on our columns several articles and reviews are still unavoidably left over till next week.

J. W. Gough.—Received.

Sapientia.—From such inquiries as we have made we believe the two persons who called upon you belong to a small gang of swindlers. This is not the first time we have heard of them.

F. J. W.—Up to the time of going to press we have not received the negative. We may, however, state, as our conviction, that the ammoniacal fumes do not cause the spots.

The Autotype Factory.—We have received from Messrs. Spencer, Sawyer, Bird and Co. a singularly fine photograph of the well-known Ealing Dean factory, printed by the mechanical process of that firm. It is one of the best of this class of prints we have ever seen.

H. F. George.—The lenses you at present possess appear to be of too long a focus. Any lens of a short focus will answer your purpose; but it would be better to write again giving us more definite particulars as to the description and foci of your lenses and the size of plate you wish to cover.

George B. White.—The method we usually adopt to clarify gelatine is to have it at such a temperature as will render it quite fluid, and then add to it some white of egg and mix the two well together. The temperature is now raised, by which the albumen is coagulated, and may then be easily separated.

J. S.—1. Methylated spirit of wine answers very well for making varnish —subject, however, to the fact that the methylic alcohol which is present in it is sometimes liable to affect the collodion film, owing to its being a solvent of pyroxyline.—2. The addition of oil of lavender imparts a pleasing odour to the varnish.

R. L. Allan.—The best historical matter of a general kind connected with photography is to be found in Hunt's *Treatise on Photography*. You will also get some very useful information of a historical character in our sketches of the lives and labours of Talbot and Niepce, published in our volume for 1864.

J. C. R.—A fine brown tone may be imparted to the opalotype by treating it first with a solution of bichloride of mercury, followed, after washing, by the application of a very weak solution of sulphide of ammonium. We do not, however, approve of this method of toning photographs on opal glass, owing to the liability to fading.

Reflection (Kilburn).—We fear that without a personal examination of your studio we should be unable to suggest a proper remedy for the bad quality of the lighting. The specimen enclosed appears as if it would have required a fourth longer exposure. The reflection from the white-washed wall will prove damaging; but by the intervention of a suitable screen its effects might be obviated.

George James Harwood.—Optically speaking, a perfectly-corrected portrait lens has no depth of focus; but, *pictorially* speaking, it may have. If a perfect optical instrument be what you require, then select a lens that brings objects to a perfectly-sharp focus; but if you require a good lens for taking portraits you will act wisely in sacrificing what you term "theoretical perfection" to practical efficiency.

S. W. P.—If we understand aright the manipulation of these plates the intensification had better be effected after fixing than previous to that operation. We regret our inability at present to give a description of such a drying-box as you indicate. We find that by laying them on a lever surface until the gelatine sets, and afterwards placing them in a rack exposed to a gentle current of air, the plates dry evenly and in a moderately short time.

H. D. Atkinson.—Place a small quantity of gelatine in water, and after a few hours, when it has become swollen, transfer it to a glazed saucepan or porcelain vessel, and apply heat sufficient to liquefy it. To this add enough of a saturated solution of bichromate of potash to fall just below the point at which the salt would crystallise out when it is dried upon glass. If it be found to crystallise upon drying, a little more plain gelatine must be added.

A. Harry B.—Yours in our next. Your experience is of a very satisfactory character.

Beta.—As a rule you may reckon the coffee process as requiring an exposure three times longer than would be required for a wet plate. There are circumstances under which this amount of exposure may be greatly reduced—such for instance, as a very strongly-bromised collodion and a nitrate bath of the strength of from sixty to eighty grains to the silver bath, with a prolonged immersion of the plate being sensitised. By preparing the plate in this way, and developing with a strong alkaline pyrogallic solution, the exposure may be reduced to that required for wet collodion with iron developer.

J. W.—It is impossible for us to say what should be the precise focus of a lens to insert in a portrait combination in order to effect the correction of an old Voigtlander lens that does not work to focus. We can only say, in general terms, that it must be such as will shorten the visual focus to precisely the same extent as the visual focus is at present shorter than the chemical focus. With such an addition all that is necessary is to focus the sitter sharply, remove the supplementary lens, and then expose. The resulting picture will be sharp.

H. M. Ignoramus.—1. Albumenised plates are not absolutely necessary, but it is desirable to use them to prevent the film from slipping. Of course india-rubber, gelatine, or any other substratum will answer quite as well. —2. The ordinary fused nitrate powdered in a mortar is that which is meant.—3. It is desirable to use the emulsion within a few days after being prepared. —4. The plates will keep *at least* several weeks before exposure, and a few days after it. The probability, however, is that they will retain their good qualities for many months previous to exposure. It is always safer to develope as soon after exposure as possible.—5. The anhydrous bromide differs from the other in being, as the name implies, free from water.—6. They will bear a temperature of 100° Fahr. with impunity; we should have no hesitation to subject them to a much greater degree of heat.

J. S. (Cheltenham), referring to a recent query put by him which called forth a rejoinder from another gentleman, writes:—"My reason for asking the question as to the large amount of silver used by a certain carbon company was more to call their attention to a statement received from a traveller of a large house, who stated it as a fact that such was the case; and, further, that he could not account for so large a quantity being used by a carbon company. I may say that this carbon company are constantly enlarging my negatives, and have done so for a long time past; therefore there is nothing to wonder at if 'J. S.,' of Cheltenham, did feel 'suspicious' on hearing such a statement, viz., that a hundred ounces of silver is forwarded per week to a certain carbon company. Of course I cannot believe it, as the thing would be too monstrous to think of; but I thought it my duty to ask the question in a straightforward way."

Aldermanic Honours.—Mr. George S. Nottage, of the London Stereoscopic Company, was on Wednesday elected an alderman of the city of London by a majority of thirty votes over Sir John Bennett.

The Late Sir Charles Wheatstone.—A telegram has been received from Paris announcing the decease of this eminent man of science—the inventor of the reflecting stereoscope, and also one of the inventors and principal promoters of the electric telegraph. The deceased *savant* was born at Gloucester in 1802, and was, therefore, seventy-three years of age.

## IMPROMPTU

On Viewing the Picture in the Photographic Exhibition, No. 124, *Belle and Bow*, by Messrs. Chaffin and Sons.

This fair toxophilite has so arch an eye
No need has she to sport with archery;
With gauntlets and with arm-guard garnished so,
In every contest she could win a *beau*.
Her well-fletch'd arrows would surely "hit the mark,"
And fly as swiftly as electric spark.
Such eyes as hers the sharpest darts could throw—
I am not *Chaffin*—but she needs no *Bow*.

J. H. Jewell.

## METEOROLOGICAL REPORT,

*For the Week ending October 20, 1875.*

Observations taken at 406, Strand, by J. H. Steward, Optician.

These Observations are Taken at 8.30 a.m.

| October. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 14 | 29·29 | N | 44 | 47 | 51 | 42 | Dull |
| 15 | 29·49 | NE | 47 | 49 | 56 | 45 | Dull |
| 16 | 29·69 | NW | 46 | 48 | 60 | 45 | Foggy |
| 18 | 29·87 | ESE | 48 | 50 | 58 | 40 | Fine |
| 19 | 29·77 | ESE | 48 | 50 | 52 | 48 | Dull |
| 20 | 29·51 | ESE | 49 | 50 | — | 48 | Raining |

CONTENTS.

# THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 808. Vol. XXII.—OCTOBER 29, 1875.


## ON THE RECOVERY OF SILVER FROM RESIDUES.

No doubt most of our amateur readers are careful enough, during the photographic season, to preserve their wastes, both of silver and gold, and the time of year is now commencing when such residues may be conviently transformed into a more useful shape. It unfortunately happens, however, in very many cases that the residues of even a whole season are not sufficiently large to make it worth while to send them to the refiner, and it therefore becomes necessary for the amateur to find some means of utilising his residues without having recourse to professional assistance.

Very ample instructions were given in our last volume as to the best methods of reducing residues; but those instructions refer more directly to the requirements of professionals, and will prove to be the most useful, as well as the most remunerative, where large quantities are involved. But with very many amateurs the conditions are much altered, the residues from the washings and clippings of prints, which form the principle item, as well as from the developing and fixing solutions, do not, in the course of a year, represent more than a few ounces of silver. It is to render assistance in such cases that the present article is written.

In the first place, we must say a few words on the subject of the *collection* of the wastes. These we will divide into four classes, viz., washings of prints; paper cuttings, filters, &c.; developing solutions; and fixing solutions. In order to facilitate the recovery of the precious metal and to produce the largest return it is necessary to keep these wastes separate, at least during collection, though they may in the course of after-treatment be mixed together if necessary. Before proceeding to the actual reduction we shall, therefore, give the necessary instructions for the separate collection of the different residues.

First, we will take the washings of prints. Under this head we may include any waste solutions containing silver nitrate; but in the case of a spent nitrate bath we would recommend special treatment. A large jar or other vessel having been provided for the reception of the washings or other *weak* solutions of silver, first add an ounce or two of hydrochloric or nitric acid. The presence of acid causes the more ready deposition of the fine particles of chloride which form from weak solutions; but it is scarcely material which acid is employed, as the ultimate effect of the hydrochloric is to leave free nitric acid in solution. As the washings are poured into the receptacle it is only necessary to add gradually, and as far as possible without using an excess, common salt, sprinkling it into the solution in small quantities until no further precipitate is thrown down. Before adding a fresh quantity of the waste it is well to test the supernatant liquid already in the jar, and if free from silver it may be drawn off, by means of a syphon, to within an inch or two of the precipitate before the new addition is made. The deposit of silver chloride is thus allowed to accumulate until the close of the season, when it is collected and dried.

We spoke of a special line of treatment for spent silver baths. These, whether used for printing or negative purposes, are necessarily much richer than the washings of prints—rich enough, indeed, in most cases to make it worth while to reduce and reconvert the silver without the trouble of crucible work. To effect this render the solution alkaline, and sun for a few hours; then filter and precipitate the silver in the shape of carbonate, by means of bicarbonate of soda, and wash thoroughly in *cold* water until the water shows a neutral reaction with test paper. The carbonate is then converted into nitrate by the cautious addition of nitric acid, which, at the latter part of the operation should be added a drop or two at a time, until after ten minutes' rest a very small portion of the precipitate remains undissolved. The solution is then filtered and evaporated until crystals are formed; or, if this be not desirable, it may be tested either volumetrically or by means of the argentometer and diluted to a suitable strength for use, either for printing or for negative purposes. We should, however, recommend our amateur readers to devote the nitrate of silver obtained from residues to the purposes of printing only.

The next form of residue we have to treat consists of the cuttings of prints previous to toning, as well as old filters which have been used for silver solutions, and, indeed, any paper or other fabric which may have become impregnated with that metal. In collecting these wastes it is only necessary to preserve them in a box or bag until such time as the quantity may require, or it may be otherwise convenient, to reduce them to ashes. This is best done in a tin box or earthenware vessel, placed in or near the chimney so that the fumes may be drawn away. The precious metal is then obtained in a very small bulk and must be kept for subsequent treatment.

We now come to the developing solutions. Under this heading we need only consider those forms in which silver nitrate takes an active part, such as the ordinary wet-plate development, whether iron or pyro., or the pyro. and silver solution used for the intensification of dry plates, the alkaline developer containing no silver at all. These solutions may be collected together, and, when the vessel becomes full, if upon testing with salt the clear solution be found to contain any unreduced silver (which is improbable) the addition of a small quantity of solution of protosulphate of iron will bring about its reduction. The silver is thus obtained in the metallic state, and may be collected aud mixed with the product obtained from the next and last form of residue.

This is what is obtained from the fixing solutions. The hypo. solution used for prints is generally tolerably rich in silver; but the negative fixing solution, unless used over and over again until saturated, scarcely repays the trouble of collection. The method we adopt for the recovery of these latter wastes is to place the solution in a vessel containing scraps of zinc, which will throw down the silver in the form of metallic powder. We prefer the zinc to copper on account of the difficulty in removing the traces of the latter metal from the reduced silver. At the end of the season the supernatant liquor, being found to be free from silver, is poured away and the deposit of silver collected, any scraps of unreduced zinc are removed, and the silver treated for some hours with dilute sulphuric acid in order to dissolve any minute particles of the baser metal which may remain. The black deposit is then mixed with that obtained from the developing solutions, and a further treatment with sulphuric acid for at least twenty-four hours, followed by repeated washings in pure water, is given.

The residues having been collected, the next operation is to convert them into an available form for re-use. The best way of effecting this is, undoubtedly, to reduce the mixed residues to the metallic state by means of heat; but, unfortunately, most amateurs have a dislike to this course on account of their inability to obtain sufficient heat, or, more probably, from ignorance of the process. It is, however, a very easy matter to reduce *small* quantities of silver in an ordinary kitchen fire—such quantities, at least, as those for whom we are now writing are likely to take in hand at one operation. We have ourselves under such circumstances produced a "button" weighing seven ounces and four pennyweights, the time occupied being thirty-five minutes; this, however, is more than we should counsel anybody to attempt, as it is much easier to accomplish the same work in two operations.

The only apparatus necessary will be a few small crucibles, not larger than those known, we believe, as "half-pound" ones, a pair of crucible tongs or long gas pliers, an iron spoon, and a pair of bellows. A sheet iron screen to cover the front of the grate and increase the draught will be a great assistance, but it is not absolutely necessary. The different residues, having been thoroughly dried and incorporated, are well mixed with an equal weight of dried and powdered carbonate of potash, to which may be added with advantage about one-fifth of its weight of saltpetre, also in powder.

The empty crucible having been placed in the centre of the fire is allowed to become red-hot. The best fire is one made up first with "nuts" of good, clean coal to give it briskness, and when burning freely replenish with a mixture of coal and cinders, or, better still, coke. The crucible having acquired a red heat the mixture of flux and residue is added gradually by means of the iron spoon. Each addition is permitted to "boil" up until it gradually subsides into comparative quiescence before adding more of the mixture. When the crucible is nearly full, or sufficient of the powder has been added, a large piece of clean cinder or coke is placed over the top to keep out extraneous matters, fuel is piled up around and above it, and the heat raised by means of the bellows.

If the fire was a brisk one when the crucible was put in very little trouble will be experienced in making the fresh fuel into a mass of incandescence, or in raising the crucible and its surroundings to a white, or even a purple or violet, heat. A white heat, however, is quite sufficient, and if it be continued for ten minutes or a quarter of an hour the operation may be considered complete. The crucible may be allowed to cool down to a bright red heat, when it is to be taken out of the fire by means of the tongs and allowed to get cold. Upon breaking it the silver will be found to occupy the lower portion of it, forming a solid lump or "button," as it is called. For the sake of convenience in dissolving it it may preferably be "granulated;" this is performed by pouring it immediately after removal from the fire, and while still liquid, into cold water, the result being, if it be poured from the proper height, that it solidifies in small, irregular particles, thus offering a greater surface to the action of the acid.

If, however, it be not considered desirable to resort to the method of reduction by means of heat, the various forms of residue may be obtained in the state of metallic silver by other means; that is to say, the two first we mentioned may be reduced to the metallic state, the remaining two being already in the form of metal.

In the case of the print washings which are in the state of chloride, the deposit may be treated with dilute sulphuric acid and some scraps of zinc added. This, after several hours' action, will reduce the chloride to the metallic state; but it is unsatisfactory, from the fact that it is impossible to tell when the whole of the chloride is reduced, and, further, after dissolving the metal thus formed in nitric acid the solution continues to deposit an insoluble powder for some weeks, in spite of filtering or any other treatment.

A better plan consists in dissolving the chloride in ammonia or other solvent, and, after filtering, throwing down the silver by means of zinc. In either of these cases the deposited silver must be mixed with the products of the developing and fixing solutions, receiving the same treatment with sulphuric acid in order to remove, as far as possible, all traces of zinc. The ashes obtained from the paper cuttings should be treated with dilute nitric acid (equal parts acid and water), and the clear solution filtered away from the sediment, which must be washed by passing several changes of water through the filter until no trace of silver remains. The filtered solution is then precipitated by means of zinc, and treated as in the previous cases. The residues are thus obtained in the form of powder and in the metallic state, and are ready for solution in nitric acid; we must repeat, however, that we prefer the method of reduction in the crucible.

One form of waste which we do not recollect to have seen treated, consisting of old collodion films (whether developed or not), residues of emulsions, *et hoc genus*, contains a large percentage of recoverable silver. This waste, if powdered and introduced into a crucible with saltpetre and carbonate of potash, would probably cause an explosion more or less violent in proportion to the quantity. It is necessary, therefore, to burn it in the open air first, as in the case of paper cuttings, after which it can be reduced in the crucible with impunity. This form of waste, we may remark, refuses to yield to any other treatment but that of fire, nitric acid and the zinc treatment being equally useless, owing, without doubt, to the greater affinity of iodine and bromine for silver.

## ON THE CONSTRUCTION AND USES OF PRISMS AND MIRRORS AS APPLIED TO PHOTOGRAPHY.

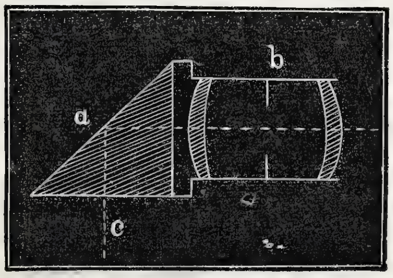
In the course of an article by Dr. Nicol, in last number, reference was made to certain photographs of marine objects which had been obtained by the aid of a prism. As no description of the special means employed, nor of the *rationale* of the prism when so applied, was appended, we shall here give an account of the means by which a prism may be employed, its use when so employed, and of an effective substitute for a prism when that somewhat expensive adjunct to a lens is not at the command of the photographer. Numerous scraps of information relative to this matter have from time to time been given by us in these pages; we shall now, however, treat the subject in its entirety.

A necessity often exists for taking copies of maps, engravings, and other printed matter only to be found in the form, or within the boards, of ponderous tomes, which, to rear up in an erect position in front of the lens, entails much trouble and expense, special framework being required for the purpose. It is now many years since the desire was experienced for an easy means of obtaining such negatives without the framework to which we have alluded, and the most natural means of doing so consisted in placing the object in a horizontal position and pointing the camera downwards. To aid in doing this, ingeniously-contrived camera-stands have been constructed—notably, one by Mr. Hislop, which permits the camera to be placed in either a horizontal or a vertical position.

When the heliotype process was introduced the method of making copies of engravings in a reversed position rendered necessary the use of a prism or mirror in conjunction with a lens; and Mr. Edwards, at that period the director of the Heliotype Company, was not long in discovering the great advantages afforded by laying upon the ground the pictures to be copied. It is evident that in that way the greatest perfection in lighting is obtained, and to this excellence of illumination is also superadded great facility in suitably placing the article to be copied. Mr. Edwards speedily perceived that this method of arrangement enabled him to obtain perfect photographs of objects not otherwise to be secured, such as groups of shells, bones, and a number of articles which could not, when grouped upon a board, be reared up in the required vertical position. In this way were produced the finest pictures of the class of objects referred to that we have in our possession. But securing negatives of objects upon the surface of the ground, including monumental brasses and tablets, the horizontal exterior of rocks, and stationary objects in small pools and ponds, is not all that lies within the scope of a camera having a prism as an adjunct. By the simple action of rotating the cap of the lens to which the prism is attached those objects at the side of the lens or upon the interior walls or ceilings

of a building in which the camera is placed may be depicted upon the ground glass. A photograph in our possession of the groined roof of a cathedral testifies to the efficiency of the reversing instrument in front of the lens when applied to the interiors of ecclesiastical edifices.

So much for the use of the prism; now as to the prism itself. First of all, it ought to be rectangular, or nearly so, this being the most convenient form. In the diagram annexed *b* represents a compound non-distorting lens, although a single view lens will answer




as well for many purposes. Immediately in front of it is fixed the prism *a*, which is set in a cap, so as to fit upon the hood of the lens, and is capable of being easily rotated. In its present state it will only transmit to the camera images of those objects below the lens; the dotted line *c* represents a ray of light coming upwards from such objects. It passes upwards into the body of the prism till it falls upon the oblique surface or back of the prism, by which it is reflected forward without loss; for none of the light passes out of the prism at that surface. The ray then enters the lens under circumstances similar to those under which it would have done were the object itself placed in front of the camera and no prism there to intercept it. If the cap of the lens were rotated half a turn the position of the prism would be entirely changed, and the ray *c*, which is now shown to be coming from the ground, would then proceed downward from the sky.

Now as a properly-constructed rectangular glass prism, especially if large, is very costly, it may interest many to know that prisms equally effective as those of solid glass may be formed by cementing together three well-selected pieces of patent plate glass of medium thickness, by means of marine glue, into a triangular form, and then closing the ends by any suitable means so as to form a vessel to be filled with water. Of the quality of such a prism, as compared with one of solid glass, we are in a position to speak with much confidence, as we, associated with a deceased eminent optician, spent a forenoon in testing such a substitute against a very fine glass prism he had constructed. The ascertained result was that the more costly prism was found to possess no advantage whatever over the fluid one, which cost scarcely as many pence as the other did pounds.

For the benefit of those who desire to construct such a prism we give the following detailed instructions:—Provide two pieces of flat glass of the dimensions of two and a-half inches square, and a third piece two and a-half by three and seven-sixteenths. Bevel the edges on a grindstone and place them edge to edge, cementing them by means of marine glue in the rectangular position they are to assume. Next obtain two pieces of either thin sheet zinc or tinned ironware, rather larger than the ends of the newly-constructed prism, and bend up the edges for an eighth of an inch so as to form a tightly-fitting cap or endpiece for the prism. After blackening the insides, and cutting a small hole in one of them, cement them firmly on the glass triangular vessel, which must now be filled with water or any other desirable kind of fluid. On the occasion to which we have referred as "pitting" our prism, of which the above are the dimensions, against that which was made of Chance's optical glass, the former was filled, not with water, but with castor oil, which does not differ as respects its index of refraction in a very great degree from the glass of which the walls of the prism are built.

Having said this much in favour of inverting or reversing prisms, we shall now proceed to show in what manner they may be entirely superseded.

It will be seen, on referring to the diagram given above, that the reflection of the dotted line *c* takes place at the back surface *a* of the prism. Now, as the reflection will take place in an equally effective manner if a polished metallic plate be placed in the same position as that surface, the object intended to be answered by the use of this instrument will be gained by means of a mirror.

We would not have it to be supposed that in substituting a simple mirror for a costly prism anything of a makeshift character is intended to be introduced; for, on the contrary, a mirror will be found to possess intrinsic advantages over the prism, there being in the use of the latter two refractions to which every ray except the axial one is subjected, and which will not be the case with a mirror. It must not, however, be presumed that by a "mirror" we here mean a piece of ordinary looking-glass; this, although a sufficiently good reflector of light, is unsuited for camera purposes on account of the metallic surface by which the light is reflected being behind, instead of being upon, the glass, and in consequence of which there are two sets of reflections—one, very powerful, from the silver at the back; and the other, more feeble, from the front surface of the glass.

A proper mirror for a camera lens must be silvered on the front; and we shall conclude by giving plain directions by which such silvering may be effected in the most perfect manner.

Premising that the plate of glass to be silvered should have one perfectly plane surface, the following solutions must be prepared; and we may here state that the proportions given are those furnished to us by Mr. H. J. Burton, and by which, with a slight modification afterwards to be mentioned, we have succeeded in producing very fine mirrors:—

Solution A.

| | |
|---|---|
| Nitrate of silver | 150 grains. |
| Distilled water | 6 ounces. |

Add ammonia till the precipitate formed is *just* dissolved. To this add—

| | |
|---|---|
| Caustic potash (fresh, from alcohol) | 360 grains. |
| Distilled water | 15 ounces. |

Again add ammonia to dissolve the precipitate, and add twenty-nine ounces of distilled water. Now add a solution of nitrate of silver (with stirring) till a *slight* permanent precipitate is formed.

Solution B.

| | |
|---|---|
| Loaf sugar | 6½ drachms. |
| Distilled water | 6½ ounces. |
| Nitric acid | 17 minims. |
| Absolute alcohol | 1¾ ounces. |

Distilled water to make twelve ounces.

For use filter each solution carefully, and to nine parts of A add one part of B. Both solutions keep indefinitely.

To use this silvering solution: pour it, immediately after mixing, into a suitable vessel, and, by means of a pneumatic plate-holder, lower down upon its surface the plate of glass to be silvered, avoiding sinking it so deeply as to permit the solution to get on the back. Allow it to remain quite stationary until the solution becomes quite clear, when the operation is at an end. Remove the plate, wash thoroughly, and dry upon a pad of blotting-paper. When quite dry, apply friction with a soft and dry wash-leather charged with rouge, and the result will be a mirror of great beauty and perfection.

Instead of making solution B as above described we, on a recent occasion, substituted for the various ingredients there enumerated a simple solution of grape sugar, with a result which can only be described as quite successful. In conclusion: we may add that the mirrors in use in most of the photo-mechanical printing works in this country are silvered by a process the same in principle, if not in detail, as that here described.

## SOMETHING MORE ABOUT PYROXYLINE.

The part played by collodion in photographic manipulation is so important, and the production of an uniform pyroxyline, in many hands at least, is still so uncertain, that we have no hesitation in returning again and again to this theme whenever from our own experiments or the experiences of others any amount, however small, of fresh light seems to be thrown on the subject.

We recently had an opportunity of spending the greater part of a day with perhaps one of the oldest amateur photographers now living, and one who has spent a very large portion of his time in experimental research, especially in the direction of a support—whether collodion, albumen, or gelatine—for the sensitive salts of which the image is formed. In practical work in all its branches, and especially all the varieties of the emulsion process, he is known to be a most successful operator; and as he, in common with almost all experimentalists, regards a suitable pyroxyline as the keystone of success, our conversation naturally turned to that important substance, and we gladly availed ourselves of an invitation to watch, step by step, the production of a pyroxyline which we knew from previous experience to be eminently suited for general photographic work, and especially so for both ordinary and washed emulsions.

Our object in this article is to give our readers the benefit of the observations we then made, and of the results at which we arrived, premising that, although there may be nothing really new in the proportions of *matêriel*, the minute attention to matters of detail that may seem too trivial to the inexperienced make almost all the difference between failure and success. The necessity for close attention to such apparently small matters as a degree or two of temperature, or the addition of a few drops more or less of water, or even to the carrying into the mixed acids the not inconsiderable amount of cold air held in the meshes of the cotton, will be evident from the consideration of the difference between a definite chemical compound, in which the law of constant proportion always prevails, and a substitution compound such as pyroxyline, in which varying quantities of an oxide of nitrogen take the place of equally varying quantities of an oxide of hydrogen or of hydrogen and oxygen, the amount of such substitution depending on the temperature and strength of the acids, the time during which the action is continued, and probably, to a certain extent, also on other causes not yet recognised.

It would appear that, at the period when simply-iodised collodion and pyrogallic development were in general use, little difficulty was experienced in obtaining a suitable pyroxyline, a mixture of nitrate of potash and sulphuric acid yielding, at a comparatively low temperature, a very useful article. On the introduction, however, of a bromide and an iron developer it was gradually discovered that a somewhat different collodion was required, and, further, when the system of dry plate work was introduced, the necessity for a considerable modification in the pyroxyline became much greater. At this stage, as shown in a recent article, Mr. Hardwich stepped in with his valuable aid, and to him more than to any other we are indebted for the large measure of success which at present results from the operations of both amateur and commercial makers of pyroxyline. But that the difficulties have not yet been altogether overcome is evidenced from the fact that an unsuitable sample of pyroxyline is not an infrequent cause of failure, and that those who work most know best how difficult it is to procure pyroxyline of an uniform quality, either in their own laboratory or from the commercial manufacturers.

The collodion at present in general use may be classed under three heads—the tough and skinny or horny, the powdery, and a medium between the two which possesses the good qualities of both without most of their drawbacks. The dry-plate worker generally has a strong preference for the second variety; but, although it has many good qualities, it is prone to yield hard, patchy negatives, and is by no means so valuable as the third kind, which, when really well made, is equally suitable for all purposes. It is generally admitted that what is required for the highest class of negatives is a rich, creamy, almost opaque, film, and this can only be secured with a pyroxyline carrying the largest possible amount of haloid salts without throwing out the iodide of silver in the form of the usual yellow streaks which generally appear towards the lower end of the plate on its removal from the bath. It is well known that collodions made from different samples of pyroxyline differ very much in their fluidity; that is, of two samples, each containing say six grains of pyroxyline to the ounce of solvents, one will be much too thick for ordinary use, while the other may be much too thin. Now, from the experiments we saw made, we believe that the power of a film to carry iodide of silver depends entirely on the solubility of the cotton, or, rather, on the quantity of cotton required to make a collodion of the requisite thickness. In other words, if a sample of the tough, gelatinous cotton, four grains of which make a collodion of ordinary thickness, will only carry four grains of the mixed iodides, every additional grain of cotton which, from its nature, may be used without making a too thick collodion will permit an additional grain of the iodising salts to be carried without throwing the iodide of silver out of the film. This we consider a point of the utmost importance and one deserving of fuller investigation, as we know that much of the collodion in general use gives a film a great deal too thin and bluish-tinted for the production of the best class of negatives.

From experiments since made with the pyroxyline produced during our visit already mentioned, we are in a position to say that it possesses in a high degree all the necessary good qualities. With seven, or even eight, grains to the ounce of a mixture of three-fifths of ether and two of alcohol it forms a collodion sufficiently fluid for the coating of 12 × 10 plates, and which carries, without any tendency to throw out the iodide of silver, six or seven grains of iodide of ammonium and two grains of bromide of cadmium. This, it will be remembered, contains a much larger quantity of iodine, and forms much more iodide of silver than if a corresponding quantity of iodide of cadmium had been used, that salt containing little more than half its weight of iodine, while the ammonia salt contains seven-eighths of that element.

The experiments in pyroxyline-making were made on small quantities, partly on economical grounds and partly because amateurs are more likely to follow them implicitly on that account. The apparatus consisted of a Wedgwood or composition mortar of the size known as "No. 3" (holding about twelve ounces), a stout glass rod, three graduated measures, scales and weights, a basin of water, a batch of nitric acid and one of sulphuric acid, and a quantity of clean cotton-wool—that sold by chemists as "medicated cotton." The mortar was placed on the hob of the kitchen grate, in which there was a good fire burning, and filled with boiling water to heat it thoroughly. While this was being done the acids were apportioned out into their respective measures, which, when several batches are to be made in succession, are kept distinct to prevent the necessity for washing and drying after each measurement. When the mortar is thoroughly warmed the water is poured out and it is then perfectly dried, and three drachms of water is placed in it. On this is poured one ounce of nitric acid (s. g. 1·45), and then two ounces of sulphuric acid (s. g. 1·85). On stirring the mixture the temperature generally rises to about 165° or 170° F., and it is allowed to stand till the thermometer indicates precisely 156° F. While the temperature is falling fifty grains of the cotton is weighed out, and it is thoroughly heated before the fire, so as to raise to the highest point the temperature of the contained air, and when the proper temperature of the acids has been attained it is at once plunged in and moved rapidly about with the rod for a few seconds. At the expiration of ten minutes as much as possible of the acid is pressed out with the rod, the cotton plunged into the basin of water, and then rapidly teased out with the hands. It is of great importance that as much as is practicable of the acid should be pressed out before the cotton is thrown into the water, as if there be much left it is difficult to get it diluted rapidly enough to prevent the weakened acids exerting an injurious action on the pyroxyline. It only remains now to wash until every trace of acid is removed, and to then dry on a water bath or current of warm air. If the minute details have been accurately followed, the operator may rely on having produced a pyroxyline that will give a beautifully fluid and structureless collodion which will adhere to the glass without a substratum with most of the dry processes—a collodion with which sufficient intensity without hardness may easily be obtained, and which, generally speaking, will be in every respect equally suitable for working either the wet or dry processes.

In working this formula it is, of course, a *sine quâ non* that the acids should be precisely of the prescribed strength, and this in the case of nitric acid is not always easily procurable. Sulphuric acid

may generally be obtained of the proper strength, as it is a definite compound of one equivalent each of $S\ O_3$ and $H_2O$, anhydrous sulphuric acid and water—forty parts by weight of the former to nine of of the latter. It is always easy to obtain fuming nitric acid having a specific gravity of 1·500, and, generally speaking, a variety of 1·420 can readily be found. From such samples a simple calculation will show that a mixture of three parts of the stronger with five of the weaker will give exactly an acid of the required strength of 1·450. It is advisable to procure and mix a tolerably large quantity in this way, as it will keep indefinitely, and is always handy and uniform. It is also an advantage to lay in a pretty large stock of a suitable cotton, as, although it is nearly pure cellulose, it contains variable quantities of other matter, which sometimes slightly modifies the resulting product and requires a slight modification in the manipulation; but when a large supply is on hand, the slight difference once arranged for, it can be, of course, continued in all succeeding experiments.

In conclusion: we may say that, although there is no apparent solution or disintegration of the cotton, there is, nevertheless, a considerable loss which can only be accounted for from that cause. If we suppose even a low oxide of nitrogen ($N\ O$), to displace an atom of water ($H_4\ O$), we should have for each eighteen grains of water displaced an increase of twelve grains. Now, as the mean of a series of experiments shows only an increase of slightly over three per cent., it will be evident that that can hardly represent the full amount of the substitution.

We think it would be both interesting and useful if we had a careful determination of the actual quantity of nitrogen contained in such samples of pyroxyline as experienced workers have found to be most suitable, and hope, by and by, to find sufficient leisure to undertake the examination; meanwhile we shall be glad to receive for that purpose such samples as have been found to answer best. We shall have much pleasure in again returning to this subject when the examination has been completed. We may add that, for the method we propose adopting, samples of not less than two hundred grains will be required.

## THE PHOTOGRAPHIC EXHIBITION.

[Fifth Notice.]

The capabilities of gelatino-bromide negatives for yielding sharp enlargements is well exemplified in two groups (Nos. 91 and 152) by Mr. Penny, of Cheltenham, the gradation and detail being excellent. In the first we recognise, among a few peripatetic photographers, the honest face and form of our well-known friend Mr. Baynham Jones, as seen reclining in the centre foreground. The negatives have been taken on Kennett's pellicle. *A Wayside Bridge* (97) is a fine picture of large dimensions—a landscape—including a stream and a rustic bridge, by Messrs. Bool, who also exhibit others of similar dimensions and equal merit—notably *A Water Mill at Selborne* (234). *Olden Times* (111), by Mr. A. Ford Smith, is a skilfully-executed combination picture, comprising a lady and gentleman in mediæval costume seated in a room with surroundings of the same period. This artist also exhibits several excellent landscapes.

Mr. Samuel Fry exhibits two *genré* pictures—*Sketching* (115) and *Pensées* (116). The latter represents a comely maiden of the fishwife class sitting by the side of a boat, and suspending for the moment her avocation of mending nets to indulge in one of those pensive reveries by no means unknown to females of this class when a wild sky, betokening a tempest, indicates coming danger to friends or lovers where, "by strength of heart, the sailor fights with roaring seas." In both of Mr. Fry's pictures the figures are carefully posed and skilfully photographed.

Mr. Slingsby only sends one picture (119), which we presume to be a combination subject. It represents two ladies indulging in some quiet talk by the fireside. The picture is large and imposing, and everything is in the excellent keeping so characteristic of Mr. Slingsby's work.

It would be gratifying to know how Mr. G. Nesbitt contrives to get his children posed so effectively. In No. 150 we have a couple of children reclining on the grass, tended by their mother, all in a most natural manner, the facial expressions being perfect; not less so is No. 151, in which a child is represented as being asleep on a couch, the mother anxiously watching over the slumbers of her darling. These are not, however, the only specimens of this kind exhibited by Mr. Nesbitt—a small picture of a similar character on one of the screens being equally effective.

In a portrait (130), by Mr. J. M. Young, is successfully overcome the difficulties inherent in taking the portrait of a lady attired in a white dress, the latter being very soft and fine. His picture No. 158 is more pretentious, and, we may add, one for which he is entitled to high commendation. It represents a young lady seated, and gazing with a somewhat sad look through a window—a subject treated very frequently by other artists, but seldom in so successful a manner as in this instance.

The *Sleeping Beauty* (No. 148), by Mr. F. Hollyer, is a picture of a class that may be designated "a sell." Instead of a charming young lady being seen caught in the arms of Morpheus, we are presented with the phiz of a semi-somnolent bull-dog of the most ferocious type. What *is* beauty? We know of many who can recognise points of extreme beauty in what is to some the intensely-forbidding aspect of the English bull-dog of pure breed. Be that as it may, Mr. Hollyer has made a capital picture of this "pet," nor is he less successful with other pictures of animals.

Mr. G. F. Dew contributes several fine pictures of scenery in the vicinity of Leamington. This town is associated with the possession of good photographers and the production of good photographic work. Does this arise from the fact that this favourite watering-place is situated amidst scenery of the most artistic, attractive, and romantic character? Doubtless this is the case to a large extent, owing, probably to the fact that a man with a natural love for, and appreciation of, the beautiful, when in the midst of scenery of a highly-romantic character, becomes so quickly imbued with an art-feeling congenial to the scene as soon to attain a high perception of the varying degrees of beauty in such scenery, and hence his pictorial transcripts will necessarily partake of the character of the natural beauty which thus keenly prompts his artistic perceptions. Leamington photographers, therefore, are expected to produce work of the highest order. To return to Mr. Dew: he contributes several charming views taken in the vicinity of Leamington, of which we prefer, on the whole, *Kenilworth Castle* (243).

A *View in Ryedale* (229), by Mr. J. W. Lumley, is an excellent example of this artist's work, who also exhibits several other pictures.

The wild, sombre scenery in the North of Scotland suffers no injustice at the hands of Mr. F. S. Schwabe, who contributes a variety of views taken in that part of the kingdom. *Loch Coruisk* (260) is a favourable specimen of Mr. Schwabe's work.

## ALBUMEN IN THE NEGATIVE BATH.

Mr. S. Fry, in his communication to the South London Photographic Society, promulgated the idea that the introduction of albumen did not cause any deterioration of the negative bath—an idea so contrary to the usual experience of photographers that it merits some consideration.

That a solution of nitrate of silver will coagulate albumen is right to a certain extent, but that it will effect a coagulatory action on the *whole* of any quantity, much or little, of albumen submitted to its influence is delusive; some portion, however concentrated or dilute the nitrate solution may be, is invariably dissolved. This is daily exemplified in the process of sensitising albumenised paper, when, irrespective of the strength of the solution, it will gradually become discoloured, and, providing the albumen with which the paper was prepared was slightly putrid, the odour is communicated to the solutions; the limpidity is also affected. A much-used bath will be found to have gained a considerable "body" since it was first used. All these facts plainly point out that some of the albumen is retained in a solution of nitrate of silver, and is not all coagulated, as Mr. Fry would lead us to suppose.

Albumen in solution in a nitrate negative bath has been proved beyond doubt to be deleterious to clean and satisfactory working by hundreds of photographers; we must, therefore, look for some other conditions that have neutralised the ill effects of a constant addition of albumen in Mr. Fry's practice. In reply to a question put by a member of the Society as to the acidity of Mr. Fry's bath,

it was evolved that he used it exceptionally acid with nitric acid, ounces being used where other photographers used minims. When we take into consideration that *two ounces* of nitric acid are added to an eighty-ounce bath, instead of a few drops or none, the singularity of the non-prejudicial effect of introducing albumen is somewhat accounted for, as also the more perfect coagulation of the substance.

Not one photographer in a hundred, I dare venture to say, uses acid to this extent; and unless they do the introduction of albumen will, without doubt, be attended with prejudicial effects. For my part I am satisfied with a slightly-acid bath, and have never tried the excessive quantities advocated, I believe, in the first place by Mr. Black, nor have the negatives brought to my notice prepared in such acid baths tempted me to make the alteration.

That albumen is useful in making the highest class of negatives I am perfectly convinced, and that there is no greater aid than albumen for giving richness and fineness of image; but so many difficulties arise in working the wet process if any attempt be made to combine collodion and albumen before sensitising (except where albumen is used in a very dilute form to prevent films slipping, or rendering the glass surface more perfect), that few trouble themselves about it.

Some time since I brought to the notice of photographers a method of combining the two substances, albumen and collodion, after sensitising, thereby gaining many of the good qualities of the ordinary collodio-albumen process with wet plates. This is by adding albumen to the developer—an addition, by the way, that not only improves the quality but simplifies operations; no re-intensifying being required and no risk is incurred in films slipping more than when the albumen is applied as a preliminary coating to the plate. If photographers would give this plan a trial they would, I am convinced, adopt it in preference to the regular method of working wet plates, and soon decide that the little extra trouble of preparing such a developer was amply repaid by the many advantages gained.

EDWARD DUNMORE.

## BUILDING, WARMING, AND VENTILATING STUDIOS.

ATTENTION is now being called to the erection of studios and the improved manner of lighting them; and, as far as I am able to judge, there is wisdom in accepting the advice of those who have made a special study of some particular requirement. There is no "patent medicine" that will soothe *all* the troubles which photography is heir to. My own professional calling has brought me, during the past twenty years, a great deal into contact with those who either were about to erect a studio, alter one, or sometimes transplant it some miles distant; and I have invariably found that the undertaking far exceeded the photographer's estimate both as to the cost and the facility with which it could be done. A joiner has certainly the faculty of construction more fully developed than is naturally expected to be found in a photographer; but the difficulty is that inefficient mechanics all profess to be skilful in dealing with everything connected with their own trades, and studios are built on plans made up of hastily-considered details, which are clever enough in their way, but are capable of considerable improvement, and of being made more efficient if the same work had to be done over again.

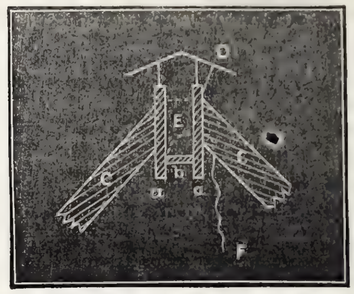
Many studios are well built and perfect, but must be left where they are first erected, as they can never be rebuilt in their entirety on new ground. Others are perfectly portable, can be taken down and put up in a very few days, but frequently they are but half water- or weather-tight—a sad complaint during the winter months; they are badly warmed and not too well ventilated—two matters in connection with photography which go a long way in influencing the quality of the work produced in such studios.

As to the portability of studios: it is, in the majority of cases, of the utmost importance that they should be capable of being taken down and rebuilt without great loss of either time or *matériel.* Whoever has made a new photographic tent will have discovered that a second attempt was an improvement on the first, and a third equally superior to the second; so I may say that my notions of twenty years ago on how to build a studio have been subject to so much modification that, like those of everyone else who has watched the progress of photography, they have become "improved" out of existence.

The size and shape of a studio are controlled by surrounding circumstances; but I think that in one or two particulars the majority of photographers agree—one of which is that the ridge-roof form has proved, by experience, to be the best adapted for good portraiture.

The ridge can be made a very efficient ventilator if constructed as shown in the annexed diagram (*fig.* 1). The ridge pieces *a* being $1\frac{1}{4} \times 7$ inches, separated by a three-inch block E, placed at intervals of about a yard, with the hinged shutter B to open and close by the cord shown at F. In summer time the shutters are all kept open, and ventilation by this means is secured in a most perfect manner; that is, if we provide an inlet for fresh air in the proper place, as we have done for the exit of the vitiated air. The pieces D will be made to keep the rain from blowing down between the opening at E; it can be kept up by iron stays screwed and the ridge piece. A bed-screw through the ridges and block E makes all rigid when up, and portable when required to be so. C C are the rafters. Even these can be made to lift on and off with the greatest ease. At the joint where they are, or should be, nailed to the ridge, fix dovetail plates. A round-headed screw fixed on the rafter is made to drop into a slot in a plate fixed on the ridge. The rafters should be $2\frac{1}{2} \times 3\frac{1}{2}$ inches.

FIG. 1.



I have now done with the framing of the ridge, and turned it to an additional useful purpose in the bargain. But the question may be asked—Why adhere to the dimensions given? The reason for so doing is a good one. All sawn timber that comes into the English market has definite dimensions:—$7\frac{1}{2} \times 2\frac{1}{2}$ inches is a batten, $3 \times 9$ a deal, and $11 \times 3$ a plank. They are bought and sold by the standard. £9 a standard reduces the price to a penny a foot, if it were all cut up to an inch thick and measured as a foot wide. But £9 would be too low a price for 1875; so take it at £13 10s. a standard, and your wood costs 1s. $1\frac{1}{2}$d. a yard superficial at one inch thick.

Now that you have got the formula for estimating the cost of your wood, like everything photographic the educational portion now comes in—the cost of working the material. Three-halfpence a foot on the inch stuff will about pay for framing, such as the roof and the sides of the studio; but remember that if the rafters are nailed they are not to be estimated as "framed." Although the information contained in this communication may be too meagre to make every photographer his own architect, yet it will, I think, be of some use to those who contemplate to be either purchasers or erectors of studios. I shall now deal with the other portion of our portable studio.

The foot of the rafters shall be dealt with in the framing of the sides. The sides will be best framed in widths of four feet, with two fitting-in pieces placed sixteen inches from centre to centre. When these four-feet framings are joined together the dimensions offer facilities for lathing and plastering on the inside, as laths are generally four feet long and will not require cutting, thus saving material and labour. Allowing two coats of plaster with laths—cost, one shilling a yard—this will not only be cheaper than woodwork that could be removed, but the cost of new will be less in the labour and waste in removing than if it were wood lining; besides, as affording a suitable surface for papering, the plaster is unquestionably the better.

The four-feet framing is to be $2\frac{1}{2} \times 3\frac{1}{2}$ inches, placed, as before stated, sixteen inches from the centres; but one piece should be $3 \times 5\frac{1}{2}$ inches, planed on the outside and ploughed so as to allow a three-quarter-inch shutter to slide from the top into it. These framings are to be bolted together with bed-screws, and thus the whole side will form one framing ready to receive the panels or shutters, which will be best made about four feet deep, tongued with a hoop-iron tongue to slide one into the other and make all weather-tight. These panels can have hooks fixed, to bring them tight to the intermediate pieces in the framing. The plough groove in the framing should have a small groove in one of its internal sides, so that when the panel is in position the little groove can be filled with tallow (having a little rosin mixed with it) teemed in from the top whilst hot. The joint will now resist wind and rain. The foot of the rafters should have a screw-head, as described for the top end, with the dovetail plate fixed on the wall piece, technically known by joiners as the "wall plate." This wall plate is the top of the wood framing, whilst the dovetail plate is of iron. Fit the rafters on and in position with a lath between, just held by a small nail, so that the rafters cannot slide and become loose. The roof and sides are now made firm, and the flooring joist, $2\frac{1}{2} \times 7$ inches for fourteen feet bearing, had better be dovetailed to the depth of one and a-half inch into the sills of the framing.

The joists are an important feature in a photographic studio. If they be weak every movement of the body causes the camera or the

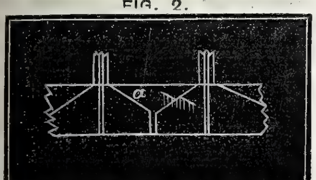
stand to vibrate, which becomes painfully evident on developing the negative. An iron rod should run through the centre of the joists, but crosswise, having pieces of wood called "bridging" between each joist, so that when the rod is tightened up the floor loses its elasticity to a very great degree, and we have an additional safeguard against foggy pictures. Once made, the floor-joist is a movable feature, without entailing either loss on labour or material. Flooring boards are not so pliable in the hands of the studio mover. Take them up with care, use up what you conveniently can in the removal, and the remainder will come in handy for lighting the studio fire. Thin flooring boards are worth about two shillings a square yard when laid, so that great mechanical ingenuity will hardly pay in maturing a clever way of making them movable without loss of material, &c.

The covering of the rafters with wood cannot be so ingeniously done that the material will come in again in case of removal without considerable loss. Slates may be taken off with such care that the greater portion may be re-used. Three shillings a yard will pay for this.

The skylight should be made of bars four inches deep by two inches thick, and not closer than eighteen inches apart. Placed closely together they obstruct much light. The fixing of the skylight should be done so that the top of the sash be level with the top of the rafters. The object of this is that the slating can be carried a little way on to the outer sash-bar (or "style," as it is technically called), and made water-tight with a fillet of mastic mixed with oil. The skylight is usually fixed after the roof timbers are on, and raised three or four inches up; but the result of this is that it involves a plumber's bill for what are termed "flashings" fixed below. The slating saves this item.

Another point worthy of consideration in connection with this feature of our studio is that rarely any provision is made for the carrying away of the condensed moisture which may be seen streaming down the inside of the sashes in cold weather. The most effectual means that I have employed for fulfilling this end will best be explained by the annexed diagram (*fig.* 2), which shows two sash-bars framed into the bottom rail of the skylight; the portion *a*, between the bars, is sunk to the extent of a quarter of an inch, which is formed for the reception of the condensed moisture, and which flows out by the little groove shown, instead of running down the face of our perpendicular light.

FIG. 2.




Most of the other portions of our studio can be fitted up by the orthodox joiner's "usual" method. The "fittings" for the dark room and printing-room, if left in the hands of tradesmen, will involve a considerable plumber's bill. The best kind of sink is that formed of slabs of slate one inch thick and of the required dimensions to suit the situation, secured together by iron rods with nut, screw, &c.—an idea easily carried into effect when the contractor becomes innoculated with it. But the making of it water-tight is best effected by mixing up plaster of Paris with hard, white spirit varnish. Even if you never contemplate fitting up a studio, but, like myself, rest contented to "operate" in a back cellar, make a note of this cement, as it will be found useful in a dozen ways.

The wooden washing troughs can be made water-tight at the joints with good white lead; but be sure, at every place where it is likely to open, to fix a piece of brown paper, for it swells when wet, and prevents leakage. Some old cabinet-makers use a rush for this purpose; but to the photographer that is not so handy to obtain as the article above mentioned. A mixture of red and white lead paint, inside and out, keeps the wood lining from being acted on by water, or two or three coats of Brunswick black is as good as anything I can recommend for the purpose.

One photographer with whom I am acquainted keeps his silver bath for paper in a wooden dish that has been saturated with raw linseed oil; but I should prefer to use a mixture of bees'-wax dissolved in benzine. That at 7d. a quart has answered in my hands quite as well as the more costly, even when used to dissolve india-rubber.

If it be desired to keep a studio water-tight do not neglect to have it well painted at the first. Should the reader have anything else to occupy his time it would hardly pay to do this himself, as three coats in oil only cost 8½d. a square yard for plain colours; but it is as well to watch the first operation to see that the priming is of good white-lead, and not sizing, which is sometimes fraudulently used.

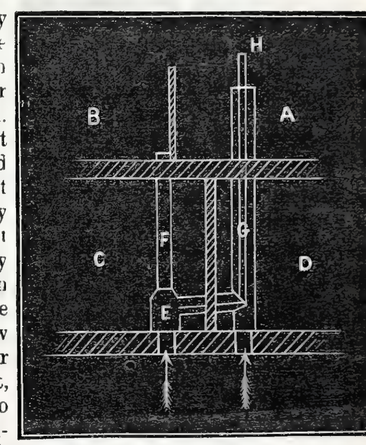
In the matter of glazing, the lap should not exceed three-eighths of an inch, as the juncture invariably shows a black line from the accumulation of dirt. The glass should be well back-puttied and placed convex side downwards, and secured on the top rebate by three-corner tin brads before finishing in putty.

This about completes the studio, but the skeleton notion of this paper can be elaborated to any extent. A word more, however, about ventilation. In referring to our first idea of dividing the ridge so as to be an exit for foul air in our schemes, an inlet also for the maintenance of it must be provided somewhere near the ground line. Now, if the side light of the studio come within eighteen inches of the floor, this portion can be made into openings hinged on the bottom side, and allowed to fall open three or four inches. A current of air will now pass through the studio from these openings and out at the ridge. They can both be readily closed for winter time; but their efficiency will be best judged of during the extreme heat of summer—a time when it will be found difficult to reduce the temperature inside the gallery to the desired extent. As an auxiliary to this let an iron pipe be carried on the slate side of the ridge, this iron pipe being perforated with small holes and joined to the water supply. It can be controlled by a stop tap from within, a turn of which will flood the roof with water, and which, in turn, brings about evaporation—a chemical means of parting with heat. The roof will cool rapidly and the delicious effect will be acceptably evident inside.

Cooling a studio is not so difficult a task as warming it when it requires to be so treated. This has been a pet subject with me for a long time past, and I may also add that it is one that I have professionally practised for many years. To warm air loaded with the vapours of ether, alcohol, and acetic acid is simply to increase their injurious and poisonous effects; and if the means employed be a cast-iron stove another deleterious element is introduced—that of carbonic oxide—which is generally too plentifully supplied when cast iron becomes superheated. So fresh, warmed air may be considered as a *sine quâ non* to start with, if the studio is to be rendered pleasant to exist in. The George's calorigen aims at this point, and, I think, pretty well meets the exigencies of the case; but it has a powerful rival in the Howarth stove, which is a growing favourite in Yorkshire.

As an ounce of practice is better than a pound of theory, I quote an instance of a photographic gallery I recently erected for Mr. Illingworth, of Halifax, and the means employed in warming it, and from which any one who is in fear of being starved out during the coming winter may possibly glean a wrinkle, enabling him to meet his own pending difficulties.

The stove E receives a supply of fresh air (as shown by the arrow) from the staircase, which is either directed through F or G or both, as may be required. One noticeable feature is that where the smoke-pipe bends and turns into G, a cold air blast from under the floor, shown by an arrow, keeps cool the point that would otherwise inevitably become superheated, or as much so as the other portions of the pipe. When the air enters below the floor at D it is cold. But after passing through G it comes out, warmed, into the gallery A; so what little of the product of combustion is lost by the smoke stack H need not be regretted, for, as Mr. Illingworth says, it has put four or five fire-grates *hors de combat*, and secures the end intended admirably.




A, gallery; B, dark room; C, work room; D, reception room; E, Howarth stove; F, warm-air pipe to dark room; G, warm air to gallery.

Fresh air and warm air well distributed is what the photographer requires; and, at the same time, it must be as pure as the chemicals used in his dark room, or his efforts will result in fog and disappointment.

I may now add that if any photographer be at a loss for any item in connection with the building, ventilating, warming, or cost of his studio I shall be glad to supply the information to the best of my ability, if he will make his inquiries through the medium of this Journal. J. W. Gough.

## FOREIGN NOTES AND NEWS.

A Micrographic Telemeter.—M. Jonté's New Dry-Plate Camera and Dark Slides.—The Prevention of Dry Spots.—Preventives Against the Decomposition of Starch Paste and Gum.—M. Ducos du Hauron's Latest Improvements in Heliochromy.

At the recent Geographical Exhibition at Paris a micrographic telemeter, the joint invention of MM. Triboulet, D'Allemagne, and

Dagron, was exhibited, and attracted a great deal of attention. This most ingenious and compact apparatus, considered by some the gem of the collection, can be packed into about three feet square, and contains an enlarging microscope; a photographic dark room and chemicals; a case, measuring about a foot and a-half long by a foot wide, for containing reduced photographs on glass, mica, or collodion; a stand for examining the microphotographs, the front of which is a glass on which a scale consisting of a series of concentric rings is engraved; a small mirror for placing behind the transparencies, to concentrate the light on them; and so on. The telemeter has been subjected to trial and pronounced a perfect success, and it is expected that it will be of considerable use both to explorers and military men, enabling them to carry large numbers of plans and maps in very little bulk. By means of it maps and plans can be easily and quickly reduced to an extremely portable size, multiplied, and the original corrected in the field; micrographic maps and plans can be enlarged for examination, and the distances on them determined by the scale; the light of a match or a cigar can be made to light up the whole surface of a microphotographic map, plan, or letter, so that there can be no difficulty in reading micrographic despatches in the field; and, lastly, the photographic dark room can be used as a *camera lucida* for the delineation of the surrounding country. Perhaps we shall be considered cynical if we say that, notwithstanding the utility of this marvellous instrument, or, rather, in consequence of the numerous uses it can be put to, it reminds us of *Punch's* wonderful bed, which could be used as a bed, a chest of drawers, a shower bath, a bootjack, &c., &c.

The *Photographische Correspondenz* gives a description of another very compact apparatus, viz., M. Jonté's dry-plate camera, which Professor Stebbing mentioned as having been exhibited at the meeting of the Societé Francaise de Photographie on the 2nd of July, and remarks that a somewhat similar apparatus was exhibited at Brussels by the American Scovill Manufacturing Company. The body of M. Jonté's camera folds and expands; the objective is placed on a movable board, so that it can be raised or lowered as required; and the whole apparatus, including the camera-stand and five dark slides, all packed into a sailcloth cover with handles, weighs only from 500 to 800 grammes (from eighteen to twenty-eight ounces). The dark slides are on a new principle, and weigh, without the glass (quarter plates), only twenty-five grammes (about six drachms). They are formed by wooden frames opening like a book to receive two plates with their backs in contact. The shutter is replaced by a sheet of hard glue, which is completely withdrawn after the dark slide is fastened to the camera and before the exposure, whereupon a thin plate of copper, set in motion by a spring, shuts the opening so as to exclude the light. When the plate has been exposed the sheet of hard glue is replaced, and the spring pushes back the metal plate.

The same journal contains a communication from Herr Fritz Haugk, in which, referring to the lengthy discussion on *The Cure and Prevention of Dry Spots*, at the last meeting but one of the Vienna Photographic Society, he recommends as a preventive measure that the silver bath be used somewhat weaker, say thirty grains to the ounce, and that the plate be allowed to remain longer in the silver bath.

An American contemporary suggests that it is not so generally known as it might be that the tendency of starch paste to decompose may be entirely prevented by mixing with it, when being prepared, a considerable quantity of carbonate of soda. By this means decomposition is prevented, and the paste is rendered more adhesive and works more satisfactorily in every way. Another contemporary, after giving an account of the way in which glycerine is produced and suggesting means for producing it in larger quantities, and consequently cheaper, by utilising the waste of soap-boiling works on a more extensive scale than is done in this country at present, goes on to say that, though the glycerine of commerce is never perfectly free from water, solutions of gum prepared with glycerine instead of water do not readily decompose.

The last number of the *Moniteur de la Photographie* contains the first portion of a lengthy note by M. Ducos du Hauron on his latest researches in heliochromy. This gentleman's process, as our readers are aware, differs considerably from that of M. Leon Vidal; but it is, nevertheless, based upon the principle of taking three separate negatives through screens of various colours, prints from which negatives, on coloured gelatine, are superimposed to produce the finished picture. The glasses employed are violet, green, and orange, and, hitherto, the difficulty has been to overcome the protracted exposure necessary in the case of the two latter. This, however, M. Ducos du Hauron has succeeded in effecting, and he now gives an account of his process, which he divides into the "wet method" and the "dry method." The former consists in the use of wet plates prepared in the bath, a simply-bromised collodion being employed. In order to render the plates sensitive to the rays transmitted by the various glasses, they are submitted to the action of different coloured solutions, on the principle of Dr. Vogel's theory. In the case of the orange glass, the plate, after sensitising, is well washed in order to free it from silver, and after flooding with alcohol is dipped for a few moments into an alcoholic solution of chlorophyll and again washed. It is now ready for exposure, which, provided the orange glass be of the right density, occupies only from fifteen to thirty seconds. The development is best effected by the alkaline method. The chlorophyll solution is easily prepared by soaking a quantity of freshly-gathered ivy leaves, cut into small pieces, for twenty-four hours in strong alcohol. Upon filtering the alcohol at the end of that time it will be found to have acquired a deep green colour, offering this peculiarity—that when viewed by transmitted light it appears red. This solution only transmits the red and orange rays; hence its use in connection with the orange glass. The colouring matter employed with the green glass is aurine, which may be added to the collodion or applied in solution as may be preferred. In the former case it will be necessary to saturate the preservative bath with aurine, in order to prevent its dissolving that substance from the film during sensitising. The latter bath consists of the alkaline gelatine mixture recommended by the late Mr. Sutton. It is useless to employ any coloured matter with the violet glass. In order to secure uniform density in the three negatives they are developed, fixed, and washed, the intensification being performed in daylight by means of pyrogallic acid and silver. The chlorophyll, acting as a reducing agent towards the salts of silver, cannot be employed in the collodion unless a very acid bath be used in order to prevent fog. The details of the remainder of the process will appear in the next number of the *Moniteur*.

## NOTES ON THE PHOTOGRAPHIC EXHIBITION.

By a Visitor.

Though somewhat lacking in agreeable variety, owing to the comparative scarcity of large landscape work and figure studies, and with still a depressing preponderance of large portraits of nobodies of little artistic value and driving out of sight work deserving better treatment, the Exhibition must, from the general excellence of the pictures, be deemed a success. It would seem desirable that a limit should be put on the number of works sent by each exhibitor—say eight or, at most, ten; and photographers, especially those who are members of the Photographic Society, should exert themselves to prevent a display of scantily-covered walls, which would have been the case last year, and probably this also, if Messrs. Spencer, Sawyer, Bird and Co. and the Woodburytype Company had not come to the rescue.

The gems of the Exhibition, standing in advance of anything else, are the two studies on opal glass by Mr. Faulkner, entitled *Dorothy Morrison* and *Simplicity*—two pictures so exquisite in every respect that they should be seen by all who appreciate really artistic photography. The same charming little model, in an admirable imitation of another of Sir Joshua Reynolds's pictures, will be found in the centre of Mr. Faulkner's most interesting studies of children.

Mr. Slingsby's portrait group reminds one of the pictures by Loescher and Petsch, of Berlin, shown in Conduit-street in 1871, and concerning which I find the following mem. in my catalogue:—"On plates 18 × 14 inches or larger, the figures exquisitely rendered, with accessories *all* in keeping, the room being like a drawing-room and not an English photographer's 'chamber of horrors' or 'curiosity shop.'"

Mr. Blanchard exhibits a forcible head of Signor Salvini, but the figure studies with which he has occasionally favoured us are wanting. Mr. Fry's *Sketches* and *Pensées*, with obtrusive cloud background, are, I venture to think, a mistake, and make one lament the absence of some who have succeeded better.

Where is Mr. Abel Lewis with his *Happiness;* Mr. Hubbard with his *Pensive Thoughts* and *Stolen Moments;* and Mr. Bruce with his *Wanderers in a Foreign Land*, and other delightful pictures? Where, too, is Mr. Diston, whose pictures, though dealing with scenes of humble life, were ever free from the least tinge of vulgarity?

Mr. Hawke, whose card-pictures at the Crystal Palace some dozen years back impressed one as being of a high order, shows some charming boudoir and imperial portraits, very delicate in execution. Some portraits by Herr Thiele, of Dresden, deservedly attract much

attention; but the male figure (No. 16) is somewhat awkward in attitude, and scarcely deserves to be in such good company.

Messrs. Cooper and Moorby, Chaffin and Son, and others send fine pictures, which will, doubtless, in due time receive proper notice. The heads of about two hundred people who have "distinguished" themselves, in contrast to the before-mentioned "nobodies," will be found in two frames shown by Mr. Payne, of Aylesbury.

The enlargements are, in more senses than one, a great feature in the present Exhibition, and the two leading carbon companies contribute liberally. Those of portraits and architectural works are the most satisfactory, and in many cases really excellent. Of the latter class there is a splendid example in some monastic ruins by the Woodburytype Company, who also send a frame of small, beautifully-printed views in Devonshire. I would here enter a protest against the practice of putting forward the person who has done the mechanical work only, while the name of the artist who produced the original negative is often altogether omitted.*

The enlarged landscapes seem to show that with an increase in size beyond two or two and a-half diameters flatness and coarseness are the result. In two or three instances prints from the original small negatives are in the room and should be studied, and a comparison of the enlargements with the fine pictures by Messrs. Bool, which are taken direct in the camera, will be instructive. The loss of texture is also very apparent in the enlarged artistic studies of *Deer*, by Captain H. Ross.

In the *Cloudland* of Messrs. B. Wyles and Co. some of the examples are very excellent, but a selection of the choicer ones would have given a higher value to the work in general. Mr. Stodart also shows some fine cloud studies.

Mr. Hollyer's horses, in *Sleeping Beauty* and *Shoeing*, are successful representations of animal life, differing from the usual run of such pictures, which are too often on a par with the paintings of prize beasts at a cattle-show.

Whether owing to the scanty opportunities of securing pictures during the past spring and summer, or to the unusually early period at which the Exhibition was opened cutting off any chance of utilising the autumn, many of our leading landscape photographers have not put in an appearance. Messrs. Bool, however, have a fine display of large picturesque work, of a high degree of excellence, from which it is difficult to make any selection. It is to be hoped that Colonel Wortley, Messrs. Robinson and Cherrill, Earl, Vernon Heath, and Sanderson will next year not be unrepresented, as their pictures can ill be spared.

Mr. Crawshay's landscapes were an agreeable surprise which an acquaintance with his portrait work of former years had not led one to expect. The subjects are mostly picturesque, the point of sight well chosen, and the treatment altogether unexceptionable; and a display of more work of such a high character would have been welcome. It is difficult in his *Bluebell* and *Daisy* to trace any connection between the pictures and their titles, unless these may chance to be the familiar names of the ladies represented.

Mr. William Bedford's views of Chiswick House and grounds, taken for the Prince of Wales, are in all respects beautifully executed. The *Gateway*, thanks to the ivy, is very attractive; but there is a formality and sameness in some of the series. They show a perfection of manipulation which it will be a treat, on some future occasion, to find applied to more picturesque subjects of the artist's own choice.

Mr. Stephen Thompson sends a charming set of pictures entitled *Old English Homes*, impressing one even more favourably than his *Studies from Nature*, and which one is glad to find will shortly be published.

Mr. G. W. Wilson has some fine views of Edinburgh and Scottish scenery; and Mr. England, with a few copies of paintings and sculpture, is scarcely as well represented as usual, which is also the case with Messrs. Brownrigg, Mitchell, and Sutcliffe.

Were I not falling into the "sere and yellow leaf" I should like to join the Royal Engineers, who, judging from the delightful spots in which the pictures are taken, must, in the senseless language of the day, have "an awfully jolly time of it." My manipulation would also be improved by a little service with them under Captain Abney, who shows some interesting views of the *Nile*, *Temple of Karnak*, &c., with skies more nearly resembling those of our Western atmosphere than would be anticipated.

Mr. W. Collie's *Hot Springs in New Zealand* should not be overlooked, and there are also some enlargements by Mr. Mundy of scenes in the same quarter of the globe, together with a volume of photographs entitled *Ratomahana*, which deserve notice.

Mr. Manners Gordon, Mr. Grant, and Mr. Whiting do not show; but Mr. Henry Cooper exhibits views in Dovedale and Buxton, scarcely so fine as his *Lane near Torquay* and some former pictures, yet not meriting the punishment which they receive in the catalogue. The Assistant-Secretary must have been napping, or we should scarcely have been treated to such a series of blunders as is to be found in Nos. 371-6, not one of the pictures being rightly described. A little more information than is conveyed by the frequently-occurring term "enlargement" might also have been vouchsafed, especially as a full description of the pictures was requested to be sent in. Surely, too, the Society, with an estimated sale of four thousand catalogues, might give a more handy book—like the small one of the Royal Academy—not filled up with a list of its members, which continually intrudes itself when one wishes to refer to the exhibitors, and is of little use except to show how few of the number contribute.

Mr. Viles, following up his success of last year, sends views of churches, halls, and ruins in Shropshire—the *terra incognita* of the *Observer*. The manipulation is good, but there is a want of sunlight in some of the pictures which rather detracts from the effect. He has also some interesting enlargements from microscopic objects.

Mr. F. T. Palmer's work is very choice—particularly may be mentioned *Rabbits* and *Hedge-Sparrow's Nest;* and Mr. Catford sends some coast scenes, in which the spray from the breaking waves is well shown.

I had hoped to see more specimens of Mr. Kennett's alternately lauded and abused gelatino-pellicle process. The pictures shown are fairly satisfactory, but still not of a character to make one at once forswear collodion. Justice is, this year, scarcely done to the uranium and Liverpool emulsion processes, both of which will give results very superior to those here shown; but some excellent studies by Mr. Stenning bear strong testimony to the value of beer and albumen as a preservative.

The only piece of apparatus shown is by Mr. George Hare, from whose ingenious automatic changing-box the egress of the plate seems at first sight as improbable as that of Mr. Maskelyne or Mr. Cook (whichever it is) from the well-known corded trunk at the Egyptian Hall; yet, the secret once known, the operation is as readily performed in one case as in the other.

The Exhibition has not been without its ludicrous aspects—in Mr. Werge's letter (which, however, has been sufficiently answered) and in the incoherent, but intensely comic, remarks in a contemporary journal as to the *claims* of operators, printers, and other assistants to be present, *minus* black coats, at the *private view* of a society to which they do not belong. The Exhibition being open on two evenings in each week, there will be no bar to these worthy people seeing the pictures on several occasions if they choose, and with much more comfort than on a crowded first night.

Admirably adapted as the gallery at 5, Pall Mall, is in all respects for the display of the photographs, I would prefer returning to the cellar in Conduit-street rather than endure the sickening odour which on more than one day pervaded the room, and which was said to proceed from the cooking-kitchen of an adjoining club or hotel. It is to be hoped that the Water Colour Society, to whom the room belongs, will before another year has elapsed have taken steps to abolish the nuisance.

It is a pity that some pictures showing marked symptoms of fading were not rejected. Gallantry forbids the artist's name being mentioned, and probably operated in favour of their admission; still the sight of them in an Exhibition under the auspices of the Photographic Society can only tend to increase the distrust with which silver pictures are, often needlessly, regarded.

* We are in a position to say that these "small, beautifully-printed," and charming views in Devonshire were taken by Mr. Woodbury himself.—Eds.

## "ALL THROUGH A *CARTE DE VISITE.*"

So said my friend Dabs, in answer to a question of mine as to his marriage.

"Hold!" I replied; "pray, my dear fellow, compose yourself and take a cigar. By the time you have the weed in full blow you will have recovered from the effects of making such a statement—at least sufficiently so to get through with an explanation of the facts." So, with a sigh, Dabs resigned himself to the formula proposed, and in the course of a few minutes had begun as follows:—

"Well, Rolly, it is now just five years since—about the time I heard of your departure for China, and at the close of the London season—that I decided to have a few weeks' sojourn amongst the hills of my neighbourhood, where nature takes a higgledy-piggledy sort of form; and it so happened the thought originated whilst I was at supper engaged studying the strata of a Welsh rare-bit, so it not unnaturally resulted in a final resolve to make Wales the place where I should spend my idle time. The next day I had safely arrived in the pretty little sequestered town of Blowhard."

"Blowhard!" I said; "whereabout in Wales is that, pray?"

"Well now, Rolly, call it what name you like—Llandudno, for instance; but I adhere to mine as both graphic and appropriate, which is essential to artists and writers, whose aim should be to delineate objects truthfully, so that instruction may be found keeping company with amusement. Why, you may not be aware that in the town I mean it is quite a usual occurrence to have the roofs blown off houses, and bathing-machines carried out to sea; so don't interrupt me any more.

"Well, about half-an-hour after my arrival I was seated quite at home in Bother-me-not Villa, which was to be my abode for a month. 'Delightfully situated, and convenient to 'bus and rail,' why, what more could any male biped want? Thus I thought as I drew my chair to the window; and the question was answered by the prettiest female form of any country or condition of life passing by the window and from

my sight, but not from my thoughts. She was photographed there in all her girlish grace, and I was answered. Yes! just such a partner as that, if content to share my span of life, was a desideratum.

"Day after day I watched her, but, fearful of offending, I slunk into reserve, until at length, one day, the fair vision vanished, and left me distracted because I had not even dared to ascertain where she resided, her name, or anything about her."

"Well, you surprise me, Dabs. What! a fashionable painter like you, accustomed to familiar converse with the elegant and refined, to be afraid of a young girl! I could hardly have thought it."

"Because you were never in love, Rolly; that is all the argument I have to offer. But chance, fate, or whatever it is that rules such things, favoured me at last."

"You met her again, Dabs?"

"Not exactly that, Rolly; but looking over a photographic studio, which is the best in the place, I discovered the *carte* portrait of my idol; it was impossible for me to mistake it—

'The meek intelligence of those dear eyes
Blest be the art that can immortalise.'

It was my fair unknown *sans doute*.

"I now got what I wanted—her name and address. We were introduced by a mutual friend, and shortly afterwards married—'all through the *carte de visite*.'"

"And so, as all stories finish, 'may they live happy afterwards.'"

"You shall judge for yourself, Rolly, when you visit us at Sunnyside."

"Another appropriate name, Dabs. Well, my dear fellow, I am answered, and you are a happy man!"

A smile and a wink was all that he vouchsafed me, as he took his hat and departed.

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"Oh! sir, whoever would have thought it? I am took all of a heap like!"

It was the voice of Slavey, the housemaid, that broke the quiet now.

"Why! what is the matter with you, Slavey?"

"Who would have thought——"

"What?"

"Why, you'd never believe it, sir! My young man, as I thought so much of, has been took up by a perliceman, all through a *carte de visite!*"

"What! another *carte-de-visite* romance! And how was that?"

"Why, you see, sir, me and my young man was a havin' of a quiet tea, the Missis being away, and I know'd you wouldn't be a wantin' of me, when, before you'd a had time to say 'Jack Robinson,' as Shakespeare says, two perculiar-looking men as were perlicemen comes in and says as how my Bill were wanted, and that they'd been a long time a lookin' for him; and then one on 'em looks at a *carte de visite* he had in his hand, and, says he, 'That there are the cove!' and they've been and gone and took my Bill up for housebreaking!"

"And you might have added for heartbreaking too, Slavey; but it is a fortunate thing you have escaped matrimony with such a scoundrel, and all through a *carte de visite!*" D. K. GRIFFITHS.

# Our Editorial Table.

### STUDIES FROM NATURE.—PART II. By STEPHEN THOMPSON.

London: SAMPSON LOW AND CO.

THE second number of this work shows a marked improvement upon that previously noticed, being superior in respect both of subjects and execution. In using the latter term we mean that the pictures possess a richer tone and greater transparency in the shadows, arising, doubtless, from the employment in printing of a more suitable description of ink. Of the four pictures in this number, two are of marine subjects—one of them, *By the Sea, Ilfracombe*, being a charming picture of dashing waves breaking upon a rock-bound coast in a most natural manner. From the admirable rendering of the surf it is evident that the picture must have been taken in a fraction of a second. In *Low Tide* we have, in the vicinity of an insignificant-looking river, a number of boats and other small craft stranded and lying high and dry waiting for the return of the tide, which will again bring life and activity to the now quiet beach. The pictures are, as before, accompanied by descriptive letterpress.

### SPECIMENS OF PRINTS ON MATT PAPER.

MR. THOMAS H. M'COLLIN, of Philadelphia, has favoured us with several very choice specimens of photographs printed upon the new matt paper made by Mr. Clemons, of that city—the gentleman so well known in connection with the method of eliminating hyposulphite of soda from prints by means of alum. While the subjects themselves are very attractive—consisting, as they do, of floral wreaths and other designs, in the arrangement of which a fertile imagination controlled by a highly-cultivated taste has revelled—it is as examples of printing we have now to speak of these specimens. A matt surface, as we have often said, is frequently of the greatest utility for various purposes in photography; and, although we are not acquainted with the means employed by Mr. Clemons for preparing his paper, one thing is evident—that he has succeeded in obtaining a high degree of vigour and brilliancy. This is shown in an especial manner in a very fine head and bust of a gentleman. The picture, which is of large dimensions, has been taken direct, and combines not only vigour but detail exceptionally excellent. Visitors to the Technical Exhibition of the South London Photographic Society will have an opportunity of examining these admirable specimens of transatlantic work.

### A QUIET CORNER OF ENGLAND.

London: SEELEY, JACKSON, AND HALLIDAY.

THIS work comprises studies of landscape and architecture in Winchelsea, Rye, and Romney Marsh, by Mr. Basil Champneys, B.A., architect, with numerous illustrations by Mr. Alfred Dawson. The leading aim of the writer of the text portion of the work is a desire that the modest and homely landscapes and architecture of our own country should secure more general appreciation. It is, however, with the illustrations we have to deal at present. These possess a singular and peculiar beauty, and an "expert" will, upon examination, soon discover that they have been engraved by some other than the means usually employed for book illustration, especially when such illustrations are printed in conjunction with typographic matter. This is the case. Mr. Dawson, a skilful artist, was led some time ago to make experiments the object of which was to provide suitable means for producing surface blocks without the aid of a skilled engraver, and was so fortunate as to hit upon, or work out, a process as simple as it is effective and elegant. So practicable is it that its application has developed into a large "industry." Details of this process are now being prepared for the readers of this Journal, or, rather, for those of its offshoot, THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1876. We, therefore, at present only bear testimony to the pictorial and technical merits of Mr. Dawson's illustrations, of which we may mention as meriting special approval—*Strand Gate, Winchelsea;* the *Stairs Leading to the Ypres Tower, Rye; New Romney;* and *Rye and the R her.*

### MISCELLANEA.

IN addition to the foregoing we have also received from Messrs. Spencer, Sawyer, Bird and Co. a fine photograph of the now extensive Autotype Works, Ealing Dean, printed by Sawyer's collotype process—a picture which attests the high proficiency to which this firm has carried mechanical or collotypic printing, as well as the great extent of the factory itself, the various and numerous *ateliers* connected with which are very distinctly shown.

From Mr. E. G. Wood, of 74, Cheapside, we have received a manual entitled *Magic Lanterns; How Made and How Used*, which contains a fund of good, practical, and really useful information on every topic connected with the magic lantern. The chapter entitled "Practical Hints to Unpractised Lecturers" should be very highly appreciated by many of those who exhibit pictures by the lantern.

We have also to acknowledge three works on spiritualism—respectively *Phenomena of Spiritualism*, by William Crookes, F.R.S. (Burns); *Miracles and Modern Spiritualism*, by Alfred Russell Wallace (Burns); and *Spirit People*, by W. H. Harrison (Harrison). Also, *Proctor's Planet Earth* (a pamphlet), by W. Carpenter; *Man's Best Food*, by the same author; May's *British and Irish Press Guide* (May and Co.); and Cassell's *Dictionary of Cookery*, Part I.

# Meetings of Societies.

## WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.

THE ordinary meeting of this Society was held on Monday evening, the 4th instant, at the Victoria Hotel, Bradford,—the President, Mr. J. W. Gough, in the chair. In consequence of the intimation in the circular that M. Lambert would be present (by invitation) to exhibit specimens of his processes, there was a very numerous attendance of members.

The minutes of the previous meeting having been read and confirmed, the Secretary read the minutes of a meeting of the Council held on the

17th ult., at which it was resolved that the annual dinner of the Society should be held on the 17th November, and that the members be invited to each contribute a few of their productions for the inspection of the members. After some conversation,

Mr. Smith proposed that the members should be at liberty to introduce a friend, either lady or gentleman.

More discussion followed, and it was finally resolved to leave the matter in the hands of the Council to make all necessary arrangements.

The Chairman then introduced M. Lambert to the members of the Society, who exhibited a large number of pictures by the Lambertype and chromotype processes, and several reproductions of negatives produced by the contretype process.

The pictures were examined with marked interest by the members, who listened in a very critical manner to M. Lambert's explanation of the method of production and the various peculiarities of the processes. The majority of the members expressed their entire satisfaction with the specimens exhibited, the general opinion being that they were the finest specimens of enlarged work the members had ever inspected—the examples in which the backgrounds had been changed, dresses altered, and light and shade modified, being particularly commended.

Mr. Smith (Halifax) proposed that the best thanks of the Society be presented to M. Lambert for his kindness in giving the members an opportunity of inspecting his numerous and splendid productions. He (Mr. Smith) said he looked upon them as triumphs of photographic art, and he did not remember ever meeting with anything of the kind from which he had derived so much pleasure as from the inspection of M. Lambert's productions.

Mr. Sachs seconded the resolution.

The Chairman, in supporting the motion, said the beauty of the results was beyond question. The progress in developing large work made our art a more monumental one, and the specimens exhibited were eminently works of this kind. If M. Lambert could teach them to produce such work as that before them in five or six hours he would assuredly earn the title of a true benefactor, for few of them, he thought, had accomplished as much in as many years.

Mr. W. E. Batho, in further support of the resolution, said that whatever the views he held personally regarding M. Lambert's patent, he was happy to add his testimony to the skill and ability displayed in the exquisite productions which had been that evening laid before the Society. Some of them he thought had never been surpassed. He believed the methods employed were of great value in the hands of a man of ability, and were capable of yielding results very much above the average.

The resolution was then put to the meeting, and carried.

Mr. Illingworth, having exhibited several chromotypes, expressed himself as being amply satisfied with the processes, and considered the sum he had paid for instruction and the right to use them was well-spent money.

Mr. Wormald, after complimenting M. Lambert on the excellent pictures exhibited by him, said it made photographers long for the day when all their work would be executed in permanent pigments, and silver printing be entirely discarded.

Mr. Greaves (Halifax) laid on the table a number of *cartes* printed in carbon by a method of his own, and invited criticism. The pictures were much admired by all present.

M. Lambert said they were the finest carbon prints he had ever seen, and complimented Mr. Greaves on being the most successful carbon manipulator he had met with; but he considered them inferior to chromotypes in gradation, the whites not being so pure. He explained that it was a peculiarity of the old method of manipulating.

Some small carbon prints, by Mr. Taylor, of the Autotype Company, were handed round by Mr. Illingworth, but were considered as very inferior to both the chromotypes and the specimens exhibited by Mr. Greaves.

After a somewhat lengthy discussion, in which several members took part, a vote of thanks was passed to Mr. Greaves for the pictures he had exhibited.

Mr. Greaves, in responding, promised to take an early opportunity of reading a paper on his method of carbon printing.

Mr. Burrow (Bradford) handed round several very fine 12 × 10 negatives produced by the Liverpool Dry-Plate Company's emulsion, and said that he had secured by its use some of the finest negatives he possessed.

After some further conversation the meeting was adjourned.

# Correspondence.

## CANON BEECHEY'S PROCESS.

*To the* Editors.

Gentlemen,—On the day after reading your editorial article on the above process (in your number of October 1st), I at once proceeded to make up a two-ounce dose. On carefully reading the article three times over I saw that there was a slight discrepancy in the quantities, and therefore inferred that the error lay in the instruction to "dissolve forty grains of nitrate of silver in one ounce of alcohol ·820."

My only alcohol being ·806, I put the forty grains of nitrate of silver (slightly pounded, but not fused) into a test tube capable of holding one ounce. To this I added twelve drops of distilled water, heated it over a Bunsen burner, and when dissolved added *half-an-ounce* of alcohol, heated again—in fact, boiled it—and the silver was nicely dissolved in the weakened alcohol. This heating was not done in the dark room, with a yellow light, but in the ordinary light of the studio. While still warm I carried it to the dark room, where the emulsion was, and in the yellow light poured it into the emulsion bottle with one plump. I corked the bottle, and then shook it well for one or two minutes and laid it aside in the dark box. This gives two ounces of emulsion containing the exact quantities mentioned at page 469 of the Journal of October 1st, and with the ether and alcohol equal. This may satisfy "Old Amateur," should he not get a better elucidation.

Now for what I did with my new stuff. After standing an hour or so, and after adding the silver, I poured a little on the corner of a plate, and in a few minutes it dried into a creamy, clean, structureless film. At the end of another hour I gave it once more a good shaking, and ten minutes afterwards coated a quarter plate, washed, soaked in the preservative about ten minutes, and, after draining a short time, tried it in the camera as a wet plate, because I was impatient to learn something of the temper and qualities of this new infant. I gave the same exposure that I would have given for my favourite of many years—a coffee plate. The development was slow, but the result was so satisfactory that I resolved to *go in for it.* This was on Saturday, so I had to let my emulsion and myself rest till Monday morning, when I coated, organified, and placed in the drying-box half-a-dozen 5 × 4 plates. During the day I amused myself with three more of the plates in a wet state, and found them satisfactory. On Tuesday I tried the six dry plates on different subjects, comprising landscape and architecture, developing each before exposing the next, in order to ascertain the range of time and quality of negative. They developed clean, although the emulsion had not been filtered, and to full printing intensity. To one I added a second dose of the carbonate of ammonia, when the intensity became far too much. This I reduced by treating with iodine in iodide of potassium, and fixing a second time in the hypo. bath.

Having satisfied myself by these and other experiments of the good qualities of Canon Beechey's emulsion and preservative, I, on Wednesday, the 13th inst., put them to practical and commercial use and comparison. Having an order to photograph a house and lawn on *carte-de-visite* size, the view including a lady and five youngsters on the lawn, and having two weeks before taken the same house and grounds on full plate, but without figures, I had an idea of the work to be done.

In ordinary cases I should have been satisfied with two dry plates; but in this case I took with me two coffee plates with the bath and four emulsion plates, as per Canon Beechey. Now, amateurs, mark this. All the stops of four of my lenses are etched with bees'-wax and acid, the relative value, and also the equivalent value. Thus, if the stop be equal to one-fifth of the focus of the lens I mark it "foc. 5," and this multiplied by itself is 25; stop one-tenth is marked "eq. 100;" stop sixeeen is marked "256," and so on.

Now Wednesday, the 13th, was a very moderately-lighted autumn day. With the emulsion plates I gave for stop 5 × 25 exactly twenty-five seconds, for stop foc. 6 I gave thirty-six seconds, and so on. With the coffee plates I gave about one-half more. In the case of the emulsion plates nearly a minute elapsed before the picture appeared, but the detail and intensity continued to grow so sweetly and nicely that at the end of about three minutes they left nothing more to be desired. They had only to be washed, dried, and varnished, and they were ready for the printer. The coffee plates, also, behaved well as coffee plates, but each had to be intensified with pyro. and silver. My preservative was, according to instructions, table beer twelve ounces, and pyrogallic acid twelve grains. I steeped for ten minutes, but am not aware whether or not less time would have done.

In haste for post,—I am, yours, &c., A. Harry B.

*October* 21, 1875.

## APPARATUS IN PHOTOGRAPHIC EXHIBITIONS.

*To the* Editors.

Gentlemen,—I have read with the greatest pleasure your article regarding apparatus—or rather the want of it—at the present Exhibition, agreeing, as it does, so fully with my own ideas on the subject.

My case is this. I am a landscape man of twelve years' practice in all parts of the world, and Mr. Frith, of Reigate, buys all my negatives. I reside, since my return to England from India, in North Devon, and hardly ever come to London, or, if so, only for a few days at a time, consequently do not get a chance of seeing new and improved apparatus.

I sent a few pictures to the Exhibition this year, and was working at Great Malvern when the *conversazione* took place. I came up to town on purpose to be present; and, greatly delighted as I was at what I saw, my satisfaction would have been much greater had there been a room of apparatus attached to it. Practically and commercially it would have been worth ten ordinary exhibitions to me, as I have little doubt that there are a great many improvements which could be made in the apparatus I use; not that mine is by any means antiquated, but still no man, unless he is in the field as much as I am and have been, can

thoroughly understand what is required, or so well appreciate it when he has it as desired.

Not only would a display of modern apparatus be to the visitors' advantage and those from a distance like myself, but it would well repay the manufacturer for getting up and displaying the same. I spare no expense in my outfit, but am a little more cautious than I was, having very often bought apparatus from descriptive advertisements, &c., which, when tested, has been utterly worthless for my work, or no improvement on that which I already possessed. One hour spent amongst apparatus with full descriptive labels attached, to a thoroughly practical man who knows what he requires, would be of much greater value than reading twenty articles regarding the same apparatus.

Now, touching your remarks about introducing matters partaking of the "shop." Granted that it perhaps does so; but would not the great benefits derived from such an addendum to the Exhibition tend to improve and elevate our beautiful art? and should we not, as a fraternity, not only countenance but encourage any way that will bring that to pass? My own experience is that the more perfect my outfit the better my work; and I hold that such is, and will continue to be, the case with all men. Surely such an end would justify the means employed to bring about that happy result. I speak as a landscape man only—one whose ways do not lie in cities.—I am, yours, &c.,

*Bonnie Cot, Lynmouth, North Devon,* F. T. Palmer.
*October* 26, 1875.

## SOUTH LONDON PHOTOGRAPHIC SOCIETY.—TECHNICAL EXHIBITION.

*To the* Editors.

Gentlemen,—Will you kindly permit me to announce that the Annual Technical Exhibition Meeting of the South London Photographic Society will take place on Thursday evening, November 11th, at seven o'clock, in the large room of the Society of Arts, John-street, Adelphi.

Anyone who has anything *new* and *useful* for photographic purposes is invited to exhibit and explain the same.

It would facilitate the business if intending exhibitors would communicate with me previously, and if all articles were sent to the place of meeting before five o'clock on the evening of November 11th.

Admission being free on this occasion, all photographers and others interested are invited to attend.—I am, yours, &c.,

57, *Queen's-road, Peckham,* Edwin Cocking, *Hon. Sec.*
*October* 25, 1875.

P.S.—The following rules have been drawn up by the Sub-Committee:—

1. That papers be allowed to be read (which must be as short as possible, and as much to the purpose as can be written); such papers to be sent to the Honorary Secretary on or before November 10th.
2. That opportunity be granted for practically working a process or making an experiment, consistently with the time at the disposal of the Committee.
3. That secret processes or patented articles, with the names of inventors and their objects, be only briefly stated by the Honorary Secretary or by a member of the Committee.
4. That explanations be allowed, but only absolutely in reference to the practical uses of the articles shown.
5. That questions may be asked of the exhibitor referring only to a clearer understanding of the subject; but that no discussion be allowed respecting objections or differences of opinion on any matter.
6. That all packages be delivered by five o'clock on the evening of the meeting, free of charge.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

Exchanges.—In our next.

F. J. W.—The spots are certainly of a most pronounced character; we, like yourself, are inclined to attribute them to the collodion.

Josh. T. Bainbridge.—We shall have great pleasure in showing the tent at the meeting referred to, and feel assured it will be well received

X. L. wishes to be informed of the best method of making unmounted prints iron, also keeping between leaves of a book for some time. He has secured keep quite flat like those sold in shops. He has tried pressing with a hot a rolling-machine, but it has not the desired effect of making them permanently flat.—If he roll the prints with a piece of card behind it will probably have the desired effect.

"Dry Plate" would like to be informed "if Captain Abney's beautiful photographs of Egyptian scenery exhibited at the Pall Mall exhibition, and also those by the Royal Engineers, were taken by the wet or by the beer-albumen process" As many others beside our present correspondent would also like to know we publish the query in the hope that Captain Abney will afford the desired information.

Anxious Inquirer.—To dialyse the gelatine-bromide provide a vessel, such as a jam pot, for which the bottom has been knocked out, and tie firmly over the end a sheet of vegetable parchment. Pour the gelatine into this and place the vessel in warm water for about three hours. All the crystallisable salts will be found to have passed through the parchment septum into the water. Gelatino-bromide negatives should be developed by the alkaline method.

Captain W. J. Parker (Punjab, India).—Post-office order to hand. Thanks. Kindly remit a further sum of two shillings for the Almanac for 1876.

C. B. A.—1. We regret our inability to answer this question at present. Full information is soon to be published.—2. Each operator prefers his own formula. We prefer three grains of citric acid and two of pyrogallic acid to the ounce.—3. You are right. It is unwise to use *absolute* alcohol under the circumstances.—4. Methylated spirit, if good, will answer.—5. Collodion made with an intense pyroxyline and a nearly neutral bath.—6 and 7. We prefer intensifying with pyro. and silver.

"Brother Smut," addressing "J. S." (Cheltenham), says:—"You shouldn't give your reasons, you know; there's your weak point. What! because a *certain* traveller for a *certain* large house told you that they sent one hundred ounces of silver per week to a *certain* carbon company, must you, therefore, suppose that your enlargements were being bedeviled in some way with silver instead of being genuine 'smut?' You shouldn't swallow all that even travellers for *very* large houses tell you."

C. A. R.—This correspondent wishes to know whether the so-called "instantaneous process" consists in any particular preparations of the collodion or other chemicals, as photographers in his quarter (Birkenhead) engage to take "instantaneous" pictures of children and animals. In reply we have to state that this term is a misnomer; what is meant is that they can take such pictures with a very brief exposure, but that may, and frequently does, mean an exposure of several seconds. The sole conditions for securing great rapidity are good collodion and silver bath, good light, and a rapid lens.

Canon Beechey's Process.—This process seems to be very highly appreciated if we are to judge by the number of letters we are constantly receiving concerning it. As we know that nothing will more please our reverend friend than to smooth away any difficulties which may be experienced by his fellow-amateurs, we commend to his kind attention a note just received from "R. A.," who says:—"Kindly inform me in your next, if possible, what you know of Canon Beechey's emulsion as to its *keeping* properties. Its manufacture is simplicity itself; if it would only keep in stock an average time it would be better still. The Canon refers to its convenience in manufacture from the very first, but says nothing about its keeping qualities."

W.—Before giving a description of the modified form of the Larkin lamp we are waiting for the anticipated and long-desired fall in the price of magnesium. Enough was said in No. 770 of this Journal to enable a skilful mechanic to construct such a lamp with every prospect of success. The burner of M. Van Tenac, from the nature of its construction, ought to give a light possessing far more intensity than any single-wick argand lamp in this country. We have long entertained the opinion that it is to the adoption of the principle of concentric wicks we must look for increased intensity in our oil lamps. We are unable to say whether this lamp or the reflectoscope spoken of can be obtained in England; we have made inquires, but have only as yet obtained negative responses.

"Inquisite," writing on the uses of dry plates to an amateur, says as follows:—Having read over Canon Beechey's dry-plate process as given by you, and also your remarks at the introduction thereof, in which you give your ideas of the *desiderata* of the amateur's dry plate, allow me to remark that I think one important *desideratum* in dry plates for an amateur like myself, for instance, who cannot (through not being his own master) go off whenever he likes, or probably has only Saturday afternoons at liberty, is that, supposing the day turns out unfavourable, the plates will keep for some time. Now, if Canon Beechey's plates will do this, and also if a few stock plates could be kept, so that a good day might be taken advantage of *at once*—say in an hour's time—then they would be a great boon to many in want of a reliable and easy dry process. If it be not trespassing on Canon Beechey's valuable time, or inconveniencing him too much, I will request him, for the benefit of myself and others so situated, to give, through your columns, his experience, or inform us of the keeping qualities of his plates. It is not so much a *long-keeping* plate that is wanted, but to save two days in preparing the plates by having a few in stock to take at any time."

"Bargo" says:—"I have a valuable 9 × 7 negative, which in transit has got a crack in the middle of the foreground, running from the edge towards the sky, and about an inch and a-half long. I do not believe that any defect would show in the print, but pressure in the frame would, I fear, send the fracture right through the negative. Can anything be done to preserve it from further damage? It is a varnished negative. I have thought the best method would be to strip it from the glass, making a film of it—a mode you have often recommended, but one I never once tried. Let me observe, also, it is one half of a panorama."——In reply:—If the glass only be cracked, the collodion film remaining whole—which, however, is scarcely likely to be the case—we would recommend the removal of the film and its transference to another glass. Or the following method may be adopted:—Apply to the crack a *very thin* solution of Canada balsam in spirit of turpentine, so as to bring the sides of the crack into optical contact, and then by means of the same kind of balsam of the usual thickness, applied all over the back of the negative, cement to it a new and strong plate of glass, taking care that there are no air-bubbles formed. After drying it in a warm place, which will take several hours, the negative may then be used with impunity.

Received.—"An Old Photographer;" "Rustic;" "Mark Oute," &c. In our next. We are also again compelled to leave over this week several articles which have been in type for some time.

CONTENTS

THE BRITISH
# JOURNAL OF PHOTOGRAPHY.

No. 809. Vol. XXII.—NOVEMBER 5, 1875.

## ON THE LOCAL MASKING OF LANDSCAPE NEGATIVES.

Neither theoretically nor practically is an evenly-lighted landscape depicted by photographic means with an uniform equality of illumination when a very wide angle of view is included. The evil has been acknowledged, and several attempts—many of them quite successful—have been made to obviate such inequality.

The subject may be divided into two parts:—First, the inequality arising from purely optical—by which we mean lenticular—causes; and, secondly, the unevenness caused by inequalities in the lighting or colour of the objects to be photographed.

With respect to the former of these—the inequalities caused by optical means—we may lay it down as an axiom that as the pencil of light transmitted axially through the lens, and which falls upon the centre of a plate, is much larger than that transmitted obliquely, and by which the sides of the picture are produced, the margin is therefore illuminated in a less perfect manner in precisely the double ratio of *(a)* the diminution of the ray of light caused by its obliquity of transmission, and *(b)* the attenuation of that already diminished ray, caused by its having a greater distance to travel after passing through the lens ere it reaches the sensitive plate. A diagram would not make this more apparent to the intelligent reader than its simple enunciation.

To obviate this inequality of illumination one of several methods may be adopted, all, however, based upon the same principle, namely, the stoppage of a portion of the central rays without interfering with the free transmission of the more oblique ones. Any means whereby this can be effected will most assuredly tend to give increased marginal illumination by retarding that in the centre of the picture. The first to perceive the defect indicated, and at the same time to point out a remedy, was Mr. Grubb, sen., of Dublin. This remedy is at once simple and efficacious, consisting, as it does, in placing at a slight distance in front of the diaphragm an opaque disc of dimensions much *smaller* than the aperture in the stop. By this arrangement it will be seen that a central or axial ray is only transmitted through the diaphragm *minus* the amount stopped by the opaque disc. A perfectly-axial ray will thus be annular. In proportion as the obliquity of the incident ray increases so does the dimensions of that ray, owing to the apparent displacement of the disc in relation to the aperture, until at last this latter stands quite unobstructed. By this adjunct *all* the oblique rays are strengthened.

The same kind of equalising effect is produced by placing a vertical bar in front of the diaphragm, as was suggested by Mr. Slight about nine years ago. This, however, operates only on the sides of the picture, leaving the foreground less illuminated than before. The butterfly stop of the late Mr. Sutton, ingenious and excellent as it was for the equalising of those portions of the picture along the central horizontal line, was, for the same reason, inapplicable in the production of a photograph with a dark foreground on account of this important portion of the picture being rendered still darker than it was in nature.

We may here remark that by far the best means of illuminating a foreground consists in placing the diaphragm, not at a right angle to the axis of the lens, but at a slight inclination towards the foreground. The practical result of this is to cause a larger volume of light to come from the foreground than from the distance, and thus to prevent the exceeding blackness and under-exposed appearance which characterise so many otherwise fine landscapes to be met with at the present day, and examples of which are far from being rare in the Photographic Exhibition now open in London.

But there is another cause of unevenness in a photograph, namely, that which arises from inequality in the nature and illumination of the various parts of the subject. This kind of inequality is found in its greatest state of perfection in the case of a white cottage strongly illuminated by the sun, and flanked on each side by large, dense, and deep-coloured trees. If, in such a case, the exposure be timed to suit the trees, the cottage will be entirely ruined from over-exposure; if, on the contrary, the cottage be made to receive *its* proper amount of exposure, the trees will be represented as a black mass totally wanting in detail; for to bring them out properly an exposure three or four times in excess of that required for the cottage is imperative. To provide a remedy for this disparity in the illumination, and the consequent preponderance of some portions of the composition over others, what we designate "local masking" should be resorted to; a means must be adopted for stopping-out certain parts of the picture during a portion of the period of exposure in the camera, allowing time for the less perfectly-lighted portions to become impressed.

A very simple and, to judge by the results arising from its use, a most excellent appliance to meet such a case as that above has recently been submitted to us by the Rev. Canon Beechey, from whose pen an article on this subject will be found in another column. Beyond saying that the appliance consists merely of a flap like a sunshade divided into three portions we shall not here anticipate Canon Beechey's description. Of the excellence of this divided flap-shutter we have the best possible evidence now before us in the form of negatives taken of such places and under such circumstances as could not possibly have ensured pictures being taken in which some portions, from comparative excess of illumination, would not quite overbalance others. This is especially the case in a negative of *Hilgay Rectory* (the residence of our reverend friend), which represents a bright, sunny, snug, little house set as it were in large dark trees. By adopting the expedient of keeping the centre flap of the shade down during a considerable portion of the time of exposure the dark trees at the sides were allowed ample time to become impressed upon the sensitive plate, after which, by raising the centre flap, the central and strongly-illuminated portion of the scene was then exposed for a brief period.

It will, doubtless, be urged, as an objection against such a method of producing negatives as that described, that lines will be caused at the junction of the two ends with the centre. Owing, however, to the fact of the shade being so close to the lens, the central part which has been stopped has been bounded by an edge of such exceeding softness that the merging from light into darkness has been so very gradual that no vertical line is apparent showing where the centre part of the picture merged into the sides.

The power thus conferred of stopping or weakening the action of the light on any desired portion of the negative is a valuable one, and is capable of many useful applications.

## ON UNIFORMITY OF TEMPERATURE.

Between uniformity of temperature and uniformity of temper—of the mind photographic at least—there is a closer relationship than would at first sight appear to the casual observer. The tendency of modern teaching is to show that there are only two things in the world, namely, matter and energy—the one the actor, the other the acted on.

Matter—consisting of, according to our present knowledge, between sixty and seventy elementary or simple bodies—is so influenced or manipulated by energy or force, in one or other of its various manifestations, as to give rise to the formation of the innumerable substances of which the world and all it contains is composed. Generally speaking, energy does its work in a quiet, unobtrusive way, although in the thunder-storm and the devastating hurricane we have occasional exceptions to the rule; but usually—so far, at least, as the processes of nature are concerned—the work progresses quietly and unseen. It is different, however, when we come to consider the influence of Art as a guide and director of energy—when in the laboratory of the chemist, for example, she can so manipulate it as to force it to assume any or every one of its various modifications, and set it to do almost any kind of work which suits her fancy, and that not only in the production of ordinary substances, but also in what may not inaptly be called the creation of bodies previously having no existence. In this respect matter may be considered as the raw material, and energy or, rather, its various manifestations as the tools with which the chemist fashions it—tools, too, much more convenient than any used by the most expert or fastidious workman; for he finds it necessary to use a particular tool for each separate variety of work coming under his hands, whereas the worker with energy possesses in it a *multum in parvo* which, in virtue of the law of correlation, he can make to assume at will any variety. Thus the energy arising from the contraction and expansion of muscle may instantly become active force; this, in its turn, may as instantly be converted into electricity, heat, light, chemical decomposition, or any other of the different varieties of energy by which work can be done.

What we have said of the chemist is equally true of the photographer. He, too, depends on all-powerful energy for the changes he seeks to bring about; and the more thoroughly he is acquainted with its peculiarities and properties, the better able will he be not only to do the ordinary work of the laboratory, but to cope with and overcome the frequently-occurring difficulties that cross his path. The varieties of energy generally employed by the photographer are not by any means as numerous as those with which the chemist has to deal, and are mainly confined to three—heat, light, and chemical action; and of these, as of all the others, it may be truly said, "these three are one." They are not only fellow-workers, each doing its share in the production of the desired result, but, under certain conditions, each may be made to do a large share of the work of the other two, while the absence of one, or its presence in insufficient quantity, will be found to be a material hindrance in any operation where all three should be employed.

The want of proper attention to this fact is a well-known cause of trouble and difficulty, especially during the winter months, and in badly appointed dark-rooms, where it is almost impossible to keep the temperature at an uniform rate, the result of the variation in temperature being a necessity for different exposures and varied development, trying to the temper of the operator and sadly interfering with the production of really good work.

To obviate this difficulty various expedients have been devised, the best of which is probably that by which the bath and developing solutions are kept in a vessel of water heated to the proper temperature. This is, however, only partially successful, as the temperature of the water soon becomes lowered, and thus forms the cause of the very difficulty it was intended to prevent.

We had recently an opportunity of seeing at work a contrivance which, we believe, would be found all that could be desired under the circumstances. It was a small and inexpensive piece of apparatus introduced some time ago, and now in pretty general use in most chemical laboratories, consisting of a stop-cock and thermometer so arranged that when a certain temperature had been attained, or, rather, exceeded, the rising of the mercury shut off a portion of the gas; or when it fell below the desired limit, the fall of the mercury let on a little more gas. In this way a water bath may be retained for any length of time at any desired temperature. Such a regulator is to be found in the stocks of some of our makers of philosophical instruments; and we feel persuaded that, wherever there has been found a difficulty in keeping the bath and other solutions at an uniform temperature during the cold season, this simple apparatus would be found very valuable.

Probably the most convenient arrangement would be a tin box closed all round, with a tin case the size of the bath, and round tins the size of the bottles let into the top, so that the bath and bottles should not come in contact with the water. Provision for the escape of any steam which may be formed might be made by a small tube coming from the top and ending in the sink. As the regulator may be set to keep the water at any temperature up to 100° C., such an arrangement would, we believe, be found useful for many purposes, such as drying pyroxyline, &c., although its greatest value to the photographer will undoubtedly be found in keeping his solutions at an uniform temperature.

## THE PHOTOGRAPHIC EXHIBITION.

[Sixth Notice.]

It is pleasing to find that this Exhibition continues to be well attended. During the frequent visits we have paid to the Gallery of "The Society of Painters in Water Colours" we have never seen the room quite devoid of visitors, while on some occasions we have found a large number present. This is gratifying, as tending to show that the interest in photography is not on the wane.

Resuming our notice of the pictures we find that Signor Lombardi, in this carboniferous year, has had the courage to exhibit an enlarged portrait in *silver*. It is an exquisite portrait of a fair lady, the *Viscountess Dupplin* (146). But not in silver alone has Signor Lombardi submitted his art-productions; for in No. 162 we have a large and singularly-fine portrait of the Right Hon. the Speaker of the House of Commons, printed in carbon, and which is an enlargement. A third picture, a charming portrait of the *Marchioness of Huntley* (337), attests the skill and taste of the artist in another direction, being a fine carbon print upon opal glass.

Several pictures of very attractive scenes are exhibited by the Rev. W. A. Crofton Atkins, among which we may indicate *Near Heron Court, Hampshire* (170), as an excellent example. The works of this artist have not fared well at the hands of the hangers, some being only a few inches above the floor.

In *H.R.H. the Duchess of Teck and Child* (197), by Messrs. Downey, we have a rare specimen of their skill. The child is one of those chubby, wide-awake, knowing-looking little mortals that instantly win their way to the hearts of the female portion of the visitors. Messrs. Downey also exhibit another admirable portrait of the same royal lady and her children (98), and also one of a leading member of the well-known Rothschild family.

Mr. E. Viles contributes largely, his pictures being all of a high class. We may here direct attention to a very commendable feature introduced by this gentleman, and which, if generally adopted, would give additional value to a large number of pictures; we allude to the attaching to a lower corner of the picture a note descriptive of the historical features of the scene. How much is the interest and pleasure derived from an examination of *Tong Castle* (272), *Moreton Cobett Castle* (105), *Pitchford Hall, Salop* (310), and the *Iron Bridge Over the Severn* (123) enhanced by the few brief and intelligent historical notes affixed! The pictures named are of very large dimensions, are choice in the selection of subjects, and faultless in execution. *Tong Castle* is probably the most attractive of the series, not a little of the excellence of the effect being due to a narrow river in the foreground, in which broad water-lilies and other aquatic plants lend their peculiar attractions to the subject. Mr. Viles also contributes an excellent collection of microscopic enlargements, the degree of amplification being very great—up to whole-plate size. Among these we may instance, as a perfect example of sharpness

and detail, the *Yellow Corn Fly*, which forms one of the series in the frame numbered 321.

"*Chiswick House and Grounds*, photographed for H.R.H. the Prince of Wales" is the title uniformly found upon all the photographs exhibited this year by Mr. W. Bedford. The whole form a brilliant series of pictures, looking like exquisite engravings when viewed from a distance of two or three yards. The particular lesson which these works impart is the great advantage of giving a full exposure. Here there is nothing savouring of hardness, although the pictures, on the other hand, are equally devoid of flatness. They are art-productions which all photographers would do well to study, being in every respect unexceptionable.

The numerous and varied works exhibited by the Royal Engineers are of such a quality as quite to justify the desire of our contributor last week, who said that if he were not falling into the "sere and yellow leaf" he would like to join that corps. The pictures are so excellent that one would naturally desire to be made acquainted with the name of the one member of the corps that of necessity has been connected with each of these works. As it is they must be treated in the light of anonymous productions, and they are of so high a class as to render it difficult to indicate a preference in any one instance. Be this as it may, *The Old Oak, Knowle Park* (286), and *The Great Beech, Knowle Park* (288), may be adduced as exquisite presentments of the pictorial work of the Royal Engineers.

The picture, *A Wicklow Glen* (313), by Mr. T. M. Brownrigg, is, in our estimation, one of the finest this artist has ever contributed to any of the annual displays of the London Photographic Society. The art-productions from the "Green Isle" contributed to this year's Exhibition are, indeed, few in number; but there is no fear of Ireland's photographic reputation suffering as respects the *quality* of work produced so long as Mr. Brownrigg is a contributor.

Mr. W. G. Hunter exhibits many charming landscapes of cabinet size. A peculiarity adopted by this gentleman in the manner of mounting his prints lessens, in our judgment, the effect that would otherwise have been secured. This peculiarity lies in each print being mounted upon or attached to a plate of glass. While it undoubtedly imparts softness, this method of mounting detracts from brilliancy. Still, apart from this, Mr. Hunter's views are exceedingly meritorious, the subjects being attractive and the treatment artistic. We may mention as favourable examples of the work of this artist one of the pictures in a frame of four numbered 358, and entitled *Aylesford, Kent*, also the four views in North Wales (363). These pictures have all been taken on Wortley dry plates.

We shall resume these notes in our next number.

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Two interesting communications from the pen of our American contributor, Mr. M. Carey Lea, which appear in our issue of October 22 and the present number respectively, call attention to one or two points in connection with dry-plate photography which might with advantage receive more careful study than, in this country at least, is generally given to them. In the former of the two articles the subject treated is the varying power exhibited by different processes of rendering the weaker effects of light, and, though in the main we agree with the remarks of our contributor, there are one or two minor points in connection with which we must join issue with him. It is only a few years ago that the universal opinion held ground that it was impossible to produce, by means of dry plates, results at all comparable with those obtained upon wet plates under the best conditions; now, however, the case is slightly changed. Though it is an undoubted fact that very many of the results produced by amateurs fall far short of even ordinary wet-plate work, still the best work of our principal dry-plate workers will compare favourably with the highest class of wet work. This alteration may be accounted for upon various grounds. It may depend upon the increased knowledge now possessed of the details of dry-plate work; or it may arise from the introduction of new methods of development and new forms of collodion or emulsion. The most general complaint against the older dry plates was the harshness and chalkiness of the results; but since the introduction of simply-bromised collodion and alkaline development these defects have been considerably mitigated, and, in addition, the sensitiveness and textural properties of the films have been improved to such an extent as to place dry plates, as we have before remarked, upon an equal footing with wet ones. Another point of difference is found in the preservative; and we perfectly agree with Mr. Lea in his remarks regarding the use of tannin, which, in our hands, has always a tendency to produce harshness of result if used in too strong solution. Coffee, however, we have usually found to give very great delicacy of detail, and with some sorts of pyroxyline to absolutely require the addition of a certain proportion of tannin to produce sufficient density. On the other hand, some samples of collodion which give too great contrast may be modified by the addition of gallic acid to the preservative. We speak of the question of relative density, because, to our mind, it is upon that one point that the capability of recording the weaker rays of light really depends; for a plate prepared under such circumstances as to produce too great density, or, perhaps, opacity, in the lights before sufficient strength can be attained in the shadows may with fairness be said to be insensitive to the weaker rays. Mr. Lea, we believe, holds this opinion, as he speaks of the two different forces brought into action in the production of the developed image, and which he calls "sensitiveness to light" and "facility of development." These we recognised, and had occasion to mention some time ago, in making a comparison of the capabilities of the bromised and chloriodo-bromised emulsions. We are about to commence a series of experiments upon the comparative effect of bromide and iodide of silver when combined in various proportions, the results of which, when completed, we shall communicate in due course. Meanwhile, we thank Mr. Lea for directing attention to a new and useful field of research.

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In announcing the preparation of our forthcoming Almanac it is enough at this stage to say that the Editor hopes, with the generous aid of those gifted friends who have aided him on former occasions, and many other skilled coadjutors, to render The British Journal Photographic Almanac for 1876 a useful *rêpertoire* for daily photographic reference, equal in this respect, if not superior, to any of its predecessors. He is well aware that many of his friends, and of the photographic community generally, at home and abroad, possess valuable stores of information acquired through study or by means of experiment, and which (although they might not in many cases consider them sufficiently important to be embodied in a formal article) he feels convinced would, if presented to their brethren even in the form of a brief jotting, prove of great value. Such hints on practical matters, "dodges," jottings, and notes on difficulties encountered and successfully grappled with as the readers of The British Journal of Photography are able and willing to communicate through the medium of the Almanac, the Editor hereby cordially and respectfully solicits, preferring the further request that such favours be forwarded to him as early as convenient.

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## ON THE PRINCIPLES UNDERLYING WET AND DRY-PLATE DEVELOPMENT.

The remarkable differences which exist between the conditions of the highest degrees of sensitiveness in the respective cases of wet and dry plates seem to me to be susceptible of the following explanation.

First, as to the facts of the case. The experiments on emulsions which I made last winter, and published in the spring, indicated that a distinct increase of sensitiveness was imparted to a bromide emulsion (whether washed or unwashed) by the addition of silver iodide, provided that the proportion of silver iodide was a small one. In this we seem to have the precise converse of the wet process, in which we gain sensitiveness by the addition of a small quantity of silver bromide, provided that the silver iodide remains in large excess.

An extended series of experiments on the sensitiveness of the silver haloids to light, also made last winter, satisfied me beyond a shadow of doubt that the combination of silver iodide and bromide was more sensitive than either silver iodide or bromide taken separately, not only to white light, but to all the different rays.

These experiments were conducted with much care. The solutions of alkaline bromides and iodides were made of such strengths that a given volume of either would in every case precipitate silver iodide and bromide containing a fixed weight of metallic silver; and when the iodide and bromide were used together these solutions were mixed in equivalent proportions, so that the whole quantity of silver iodo-bromide formed would contain the same quantity of metallic silver as in the case of the separate solutions. Therefore paper floated for an equal length of time on any of these solutions, blotted off, and floated on a solution of silver nitrate of a standard strength would, in every case, take up an equal weight of silver upon any given surface, especially as a new solution of silver was used. The comparison of sensitiveness was in each instance made by simultaneous exposure under the same negative. Trials made under these conditions must give reliable results, and these indicated invariably that the silver iodo-bromide was superior in sensitiveness to either the iodide or bromide.

This being admitted, the question arises—Why should not a mixture in equivalent proportions, so as to use iodo-bromide exclusively, be the best both for dry and wet plates?

To reach the solution of this question it is necessary to have in mind that abstract *sensitiveness to light* and *facility of development* are not the same thing and do not necessarily go together, perhaps because of the essential difference between different modes of development.

We all know that there are two essentially different modes of development. Light, in acting on a sensitive silver film, confers on it two entirely distinct properties—properties which appear to have no essential connection with each other. One is an increased tendency to attract a precipitate in the act of forming. This is the basis of the wet development. Many years ago I was able to show that this precipitate need not necessarily be silver, but that all the silver solution might be washed out of a wet plate after exposure and mercurious nitrate be substituted, so that the developed image consisted of mercury. Closely allied with this property is that of attracting a vapour, which forms the basis of the daguerreotype development.

The alkaline development depends upon entirely different properties. The silver film by exposure has acquired an *increased facility of reduction*, so that, when treated with alkaline pyrogallol, a reduction takes place. I believe I was the first to point out the nature of this development, viz., that the image was formed at the expense of the film itself; and Major Russell confirmed this view by dissolving out the silver with nitric acid, and showing that a sort of intaglio image was left in the bromide film.

At one time it was believed that one of these two functions belonged to silver iodide and the other to silver bromide exclusively. This has been proved not to be the case. On the one hand, silver bromide is capable, according to the late Mr. Sutton, of a wet development,* and, on the other, I have succeeded without difficulty in developing images on silver iodide (with the complete exclusion of bromide and chloride) by the alkaline development.

Whilst both silver iodide and bromide possess both properties, there appears to be no doubt that silver iodide possesses the power of attracting the precipitate in a higher degree than silver bromide, and silver bromide, on the other hand, is the more easily reduced by the action of alkaline pyrogallol after exposure; and it results that, if in the wet process we increase the proportion of bromide, we likewise increase the sensitiveness up to the point at which the two are employed in equivalent proportions. But the point at which the results are best has long before been passed. The power of silver bromide to attract the silver precipitate is but moderate, and is soon exhausted, so that it should be present in comparatively small quantity. (This view of the case seems to be in complete harmony with what we observe in experimenting in the wet process with different doses of bromide. When we add too much we get negatives that are full of detail, but want contrast and force, because the power of silver bromide to attract the precipitating silver is sooner expended.)

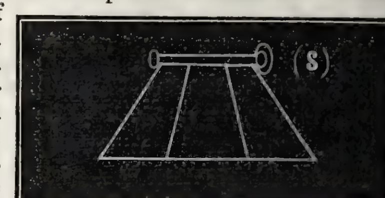
In the case of alkaline development the action seems to be as follows:—Either silver bromide or iodide, after being acted upon by light, is capable of reduction by alkaline pyrogallol, and, consequently, of giving an image; but bromide more easily than iodide. A mixture of the two does better than either; but, not unnaturally, the bromide, which does the best alone, should be present in the larger proportion. M. Carey Lea.

## ON THE ADVANTAGES OF A SPLIT SUNSHADE.

I herewith send you the promised negatives and ask you to examine them, first, by direct light as positives *from the back*, as the varnish somewhat destroys the bloom on the film side. I hope you will be able to report well of the comparison between these plates and any by the wet process. The peculiar bluish appearance of the sky and reddish hue of the buildings is the characteristic of wet plates only when the collodion and bath are in first-rate order. As negatives, requiring no intensifying, I hardly think they can be improved upon. The *Gateway of Castle-Acre Abbey* is a model of clearness and cleanness—whilst the detail in the sombre shadow on the right is very good.

If you ask me to what I attribute this excellence, it is just possible that it may be due to the fine quality of Rouch's pyroxyline, or the purity of the bromide and silver. But I verily believe, should others find that they make as good plates from the formula I have given, that this wet-plate quality will be found to be due to the employment of pure *hydrochloric acid* only, to the exclusion of either *aqua regia* or nitric acid in any shape. From the first I attributed the thin image and difficulty in intensifying, which once characterised bromide emulsion plates with large excess of silver, to the employment of nitric acid; and the fact—which, I believe, Colonel Stuart Wortley first announced—that the addition of a chloride rendered acid unnecessary, led me to try pure hydrochloric acid, by the use of which a chloride is formed and nitric acid is liberated. Of course, the use of hydrochloric acid must be considered in connection with the excess of silver and the thickness of the emulsion, converting much of the former into chloride and adding that to the bromide in suspension, but still leaving a decided excess.

I now turn to a different subject. The very sensible and appropriate remarks from Mr. M. Carey Lea on the causes of failure in dry-plate negatives, as contained in the last Journal, had been for some time floating in my mind, and I had been trying to remedy the principal difficulty; viz., that in which the attempt is made to photograph bright objects with dark surroundings in the same picture—failure in one or other being quite certain—and yet the artist is induced to try it as the object is beautiful, and he may never see it again, or if he can wait till he has no sunshine he knows he will get only a flat, unrelieved picture. I herewith send you a drawing of such a supposed case and my remedy, which I have found very successful—indeed, much more so than I expected it would be. It consists of a split sunshade (one of which I have roughly made and send you). The shade is divided into three separate flaps, thus—




These are all loose or tightened in any position by the screw *s*. The size and division of such a sunshade will require to be adapted by the optician to different lenses, according as the lens be large or small in aperture, yet only as to distance from the optical centre.

The use of such a sunshade will be at once apparent. In my sketch the camera (of course disproportionately large and not in exact position) is trying to take a white stone mansion surrounded by dark trees. In ordinary circumstances the house will either come out a white patch with black holes for windows and the roof, if slate, impenetrably mingled with the sky, or the trees and grass will present an outline enclosing a black space without foliage or detail. But now the camera says—"I have got three eyelids instead of one; and if I wink a little with the centre one whilst I keep the two outer ones wide open, I can gain a minute or two on the dark sides and grass before I open upon the white house for thirty seconds." "But how will the image come out? What about the shadow of my lower eyelid on one portion of the picture?" Well, I shared my camera's fear on this point, and thought it might have been necessary for him to keep winking and moving his eyelid, to prevent a line or marked division in the picture. I find to my delight that it is not so.

I enclose you with my other negatives one wrapped up by itself. It is a negative of my rectory house from my field—a nearly white house with slate roof most difficult to take. Please examine this negative. I gave the dark chesnut trees and grass fully three minutes' exposure before, by lifting up the whole sunshade. I exposed the house and trees together for thirty seconds in sunshine, and I defy anyone to point out the slightest trace of any division or other sign of unequal exposure. But it is not always the *centre* object which is too bright. In the little print I send one side of a beautiful archway is bleared out by my endeavour to get detail in the dark, ivy-covered reverse. If I had had my split sunshade then I could have shut out the bright stone tracery on the left for five minutes, and then have given the whole an exposure together for thirty seconds, with the result of a fine and brilliant picture. I really

* The British Journal of Photography, 1872, p. 268.

hope this invention will be a great boon to the art. As soon as you have examined the rough sunshade I have made, which is adapted to a Ross's actinic doublet, I will send it to that optician to be better made, and with liberty to construct as many such as he can find applications for. I believe they will henceforth supersede all other sunshades. St. Vincent Beechey.

N.B.—Lenses adapted with the split sunshade should also be fitted with that useful little adjunct, "*the exposure trigger*," which was introduced by the late Mr. Thomas Ross; for the sunshade requires to be very nicely adjusted in its coverings before exposure, and such adjustment ought not to be disturbed by any other means of uncovering.

[By way of append to Canon Beechey's article we may state that the negatives referred to by the author are, with several others, now in our possession, and may be seen on application at our Publishing Office. They certainly bear out Canon Beechey in all he has said. See also our leading article in the present number.—Eds.]

## JOTTINGS FROM MY NOTE-BOOK.

### The Carbon Process.

At a time when the carbon process is more popular than during any period of its history a brief recapitulation of what has been done in the past, together with the names of the doers, will not be thought inopportune.

To write a history requires more than ordinary care to avoid doing injustice to some inventor whose ideas at the time of their publication were thought of small moment; hence, without the utmost care, the real inventor is lost sight of amidst the noise and acclamation wherewith the before-neglected gift is purchased. I am not so ambitious as to attempt a complete record of carbon printing; all I pretend to is that for some time I have bestowed ordinary care on the current literature of our art-science. Any statement I may make, if there be any importance attached thereto, I am quite able and willing to substantiate by giving the date of publication, and nothing more can be required. With the veracity of the different authors of such statements I have nothing to do. I simply say that I have made tolerably copious notes on carbon printing, and, perhaps, experimented thereon as much as the average photographer.

In a well-known book—a *History of Rationalism in Europe*—a curious, and what appears to be an extraordinary, circumstance is brought under the reader's notice, namely, that scientific progress appears to have made most headway in a limited space included in the south-west portion of that continent. The reason of this cannot be entered into in a journal devoted to photography. The circumstance is only mentioned because of the similarity to the progress of carbon printing, which appears to me to have been, in this hemisphere at least, almost limited to "*la belle* France" and "bonnie England."

The birthplace of this giant of to-day was in Scotland. Men revere the past and ignore the present. Our art-science having been born so recently may be the cause of so little honour being given to its pioneers. How often is the name of Mungo Ponton mentioned or thought of—he who thirty-seven years ago sowed the germ of carbon printing, which, to-day, seems likely to supersede the more modern method in which silver is employed, and also become a powerful rival to the more aged relative, lithography? In the Edinburgh *New Philosophical Journal* of 1838 Mungo Ponton laid the foundation upon which carbon printing is built. The idea then given was not destined to remain long without being improved upon.

We next hear from France, which in this case closely followed our north countryman, and, as will be subsequently shown, bid fair to outstrip us in utilising the discovery. M. E. Becquerel saw the correct principle involved in this supposed action of light on the bichromates, and showed that *sized* paper was more rapidly acted upon than unsized. We now have a wide gap of fifteen years of inactivity. To say that the discoveries of Ponton and Becquerel lay unused during this period would not be true; but, as my sole intention is to keep to the chief points in the march of discovery in its relation to carbon printing, such must be my excuse for not mentioning those who during this period made some considerable progress in photolithography, it being my impression that such details would only tend to confuse, and should the door once be opened it must continue so to the end of the chapter.

Poitevin now brought forward a process which in England bears the date of December 13, 1855, although Poitevin wrote of it as that of August 27. I take as my guide the specification, which bears the date I quote. Here was used for the first time the circumstance that light rendering gelatine and its analogues, when mixed with a bichromate, insoluble, such circumstance would enable the operator to fix a pigment by mixing a suitable colouring matter with the sensitive compound. Upon this discovery (the fixing of a pigment) many changes have been, and, doubtless, in the future will be, rung, yet it still stands a monument of the genius of one who has left his mark in more departments of photography than one.

In the year 1856 the British Association held its annual meeting at Leeds. At this gathering Sir D. Brewster read a communication from Mr. W. McCraw, in which a process was described that enabled the operator to dispense with pigmented tissue, inasmuch as the picture was obtained by soaking the undissolved portions of the gelatine in protosulphate of iron, and then immersing in a saturated solution of gallic acid. This was aptly termed the "ink process;" but, unfortunately for Mr. McCraw, Mr. John Perry patented a process for carbon printing which bears the date of August 26, 1856, in which, amongst other things, the ink process is claimed. Here it is not out of place to say that, while I hold opinions which might or might not be generally endorsed, I shall steadily avoid giving any opinion as to the respective merits or claims for originality, being content to put before my readers mere abstracts of what notes I have made from time to time on carbon printing.

The year 1857 seems to have been the time when the experimentalists in the process under review rested awhile, and gathered strength for the race that in the following year was to culminate in the discovery of a principle without the recognition of which carbon printing must have been for ever limited to the productions of subjects in line. The period of rest before referred to had only one event to break its quiet, and that was an invention of M. Testud de Beauregard, which I cannot describe better than by saying that the colouring matter was superimposed on the sensitive coating, this gentleman denying the possibility of obtaining pictures when the pigment was mixed with the sensitive compound. The impossibility of yesterday is the accomplished fact of to-day. What strange airs are peculiar to the *genus homo!* We guide a few of nature's laws into paths to suit our wants, and act and talk as though the reins of the universe were in our hands!

The bustle of 1858 now began to make itself heard. Pouncy, Laborde, Garnier and Salmon, Johnson, Seely, and Burnett passed into view and left behind them their works—some indelibly fixed, others of a more evanescent character. Early in April Pouncy took out provisional protection for a carbon process having some similarity to Poitevin's of 1855. Now comes the first mention of a principle that has made carbon printing what it is. Poitevin says that in July, 1858, M. l'Abbe Laborde published the hitherto-unobserved circumstance that, to secure the half-tones, exposure and development must take place on opposite sides of the tissue. The importance of this cannot be over-estimated. Garnier and Salmon followed with a powder process similar in principle to the process ascribed to Obernetter for reproducing negatives. Then came a beautiful idea from Johnston, of Birmingham, who suggested the use of sugar in place of the pigment used in the preparation of tissue. After exposure and development the sugar fixed in the insoluble portions was carbonised with sulphuric acid. This was again invented, and, I believe, carried into effect, by Mr. Mabley, of Manchester. Seely endeavoured to press into the service the fact that if a carbide of hydrogen be exposed to the light in contact with chlorine the carbon is precipitated, and suggested saturating a paper with camphine and exposing in the "vapour of chlorine."

Now came the recognition of the circumstance the publication of which Poitevin ascribes to Laborde. Burnett on November 22, 1858, published in this country for the first time the fact that to secure half-tone it was necessary to expose on one side and develope on the other. With this discovery, which in the hands of some would have made a fortune, yet when given to the many was almost unobserved, 1858 closes. Here it will be convenient to halt. Much remains to be done before the improvements now immediately under notice—such as M. Lambert's chromotype—are reached; yet I shall resume with a good heart, having to deal with an indefatigable labourer who has, and would still have, done good service but for an untimely death. I refer to Mr. Blair, of Perth. W. E. Batho.

## NOTES ON PASSING EVENTS.

By a Peripatetic Photographer.

A contribution in connection with the subject of the production of photographs in natural colours comes from Mr. Wordsworth Donisthorpe, who has given his opinions and suggestions in the *Scientific Review*, the article having been reprinted in The British Journal

of Photography. What a funny fellow Mr. Donisthorpe must be to play off such a practical joke as he has done! And how excessively amiable—to put it mildly—all the editors connected with these publications must have been to allow the author's joke to pass without comment! But to the point. It is the custom for all well-conducted convex lenses to cause the rays which fall upon them in a parallel manner to *converge* towards the axis, or, as one would say in the photographic vernacular, "to come to a focus;" but in the single illustration vouchsafed by Mr. Donisthorpe this old-fashioned order of things is reversed, and the convex lens becomes—not a magnifying, but a diminishing, glass. It is true that he does not show the decomposition of his ray by means of a lens, but by a prism; but this does not make any alteration of principle in the mistake committed, which is in opposition to the following law, and which, unlike those of regal dynasties, never can and never will be repealed:—*When a ray of light is refracted through a prism it is turned* from *the edge of the prism.* If amateur lecturers on light and writers on optical subjects, who commit themselves to the diagrammatic mode of illustrating refraction without considering it worth their while to make themselves properly acquainted with the subject, would only commit to memory this very simple law they would save themselves from the liability of falling into gross blunders. The diagram which has elicited this *Note* is not the only one of an equally aberrant form which I have encountered in the course of my nomadic movements in life.

One optical theme suggests another. A writer in a weekly contemporary, the *English Mechanic*, announces his discovery—I cannot call it an "invention"—of a new object-glass for the microscope. Mr. Holmes, the writer in question, has found that when a concave back lens is added to those of the existing microscopic objective the magnifying power of such objective is very greatly increased, a quarter of an inch becoming an eighth, and so on in similar proportion. He expresses a hope that opticians will compute the curves necessary in giving practical effect to his invention, desiring no other recognition of his services in introducing it than the association of his own name with it. I feel certain that no one would grudge so small a concession to Mr. Holmes; *but* (alas! for those "buts," which so frequently will come to the surface in connection with inventions and discoveries) I greatly fear that Mr. Holmes's claim to be the first introducer of the idea is in danger of being controverted. My reason for entertaining this fear may be gathered from the following:—In certain articles on the production of photomicrographs, by Dr. Maddox and others, special attention has been directed to the use of a concave lens as an amplifier; and this concave amplifier is now a recognised appliance among the optical resources of our foremost photomicrographers. These lenses are manufactured in America for the purpose referred to, and, while I am aware that they have long been introduced into and used in this country, I further know that I have long possessed a one-fifth with a supplementary back concave of the kind spoken of by Mr. Holmes. I may here say that upon a very careful measurement I find that the magnifying power is doubled by the addition of the back in question to my one-fifth. For this reason I would venture to doubt the right to the coveted fame claimed by Mr. Holmes, more especially as he has not worked it out in such a practical form as to be useful as a guide to the makers of microscopic objectives.

I am glad to hear that the Exhibition of the London Photographic Society is well attended and is paying its expenses. I think, however, that some improvement might have been made in the hanging; for at present many large and rather—well, *not* fine—pictures have been hung on the line, while others which are smaller and finer (I say this after having been obliged to stand upon a chair to make an examination) have been "skied." I might adduce several examples of this mal-arrangement.

Observing what the Editors of this Journal say with regard to the application of a wheel and pinion to the reciprocatory burnisher introduced by Mr. Cleary, and the indubitable gain in some cases resulting from such mechanism, I confess my inability to perceive the advantage of dragging the burnisher over the face of the picture in an oblique manner at all. I quite recognise the value of what is said concerning the power placed at the option of the operator of using this instrument either as an oscillating or a stationary burnisher; but what, I think, requires to be demonstrated—and this without reference to any particular form of machine—is the advantage to be derived from making the burnisher proceed obliquely over the picture—that is, in a direction progressively from one corner to the other—in contradistinction to the direct passage from one end to the other of the same surface of steel. This is a subject which, I believe, will bear a good deal of discussion.

It is queer to observe in what manner old things become new again. A fortnight ago the English public were introduced to an albumen process by Mr. Pickerill, of America. Its peculiarity consists in a large proportion of honey being added to the albumen, which is then salted with iodide and bromide of potassium and chloride of sodium. Now this is precisely the peculiarity which characterised Whipple's albumen process, introduced in Boston in 1855, exactly twenty years ago. Another peculiarity is that the *proportions* given in the most recent publication are similar to those published by Liverpool photographers who had tried and modified the process. From somewhat protracted experiments made with it about nineteen years ago I am able to speak of its excellence.

The subject of faded daguerreotypes, and the method for effecting their restoration described by our Editors, reminds me of a so-called method of "enamelling" these charming pictures practised by a few leading photographers. The enamel consisted of varnish made very thin and pure, the greatest care being taken to ensure its perfect filtration. Daguerreotypes protected in this manner have remained in *statu quo* for over a score of years, to my knowledge.

## AFTER-LIGHTING.

If there are dreamers (says Herr Josef Ungar, in the *Photographische Correspondenz*) who, in the hours of solitary meditation, leaning their teeming heads on the appropriate support of silver-blackened fingers, allow the imposing but somewhat motley array of "accelerators" to pass in review before their mind's eye, would they not become a prey to sadness, and sum up the result of the superficial glance in a pious ejaculation, since they must remember how each of these accelerators on its first appearance in the world of light was reputed capable of shortening the duration of exposure by a third or even a half? So was heralded bromides, arsenic, and salts of lithium in the collodion with abundance of alcohol and the addition of acetate of soda in certain cases; fresh and strong iodide of silver leading to silver baths saturated with iodide of silver; free iodine, nitrate of silver, acetate of silver, and acetate of lead in the silver bath; more powerful or more heated developers; developers containing acetate of iron, nitrate of potassium, acetate of ammonium and of morphia, besides many other accelerators already relegated to the permanently superannuated list; and last, but not least, the odorous methylal in the iron developer. Such an abundance of the glorious thing, by each individual item of which, and still more when employed in groups, one would be warranted in expecting that a degree of sensitiveness must be created which would deprive any reasonable pessimist of every pretext for bemoaning himself over the weakness of the light or the restlessness of the sitter.

If, however, the gloomy thoughts of the pessimist are groundless, then let some one explain to me how it is that, as a rule, exposures are not shorter now than three lustres ago, when most of these accelerators were yet unborn; or whence the eagerness still manifested for new expedients which promise short exposures. Are those discontented ones right who believe further research necessary? When, a short time ago, the experiments in after-lighting, which had been obsolete since the daguerreotype epoch, were revived, many professional photographers of a sceptical turn of mind, whose complaints are still ringing in our ears, received the news with great caution and little faith; many, indeed, were inclined to scout the notion altogether and shrug their shoulders at it. Fortunately for themselves, however, they did not put their intention precipitately into execution, as they would have been in the wrong, and would themselves have deplored their undue haste when the assertion was established by demonstration. I, myself, though at first numbered amongst the doubters, was convinced by two singular experiences. The first of these was an observation that has been made already, namely, that a mounting projecting before the lens occasions a marked protraction of the exposure; the second is embodied in the following curious history of a circumstance which happened a long time ago in my laboratory.

One evening, towards dusk, I was alone in my studio, when a lady entered, breathless, holding her little one in her arms, and begged urgently that I should immediately take her and her son in a cabinet-sized group, as it was the very last available moment before her husband's birthday. After a short, hesitating, but vain denial I go into the dark room, for the minutes are precious. The plate is prepared and a very promising pose is assumed. In a few earnest words I tell the lady to keep herself and the child quite still in the prescribed position. The child smiles at me in a friendly manner. "The gods favour the bold," think I, and hope to complete my task

in some twenty-five or thirty seconds. In order to fix the child's attention I do some hocus-pocus business, and take off the cap—four, five, six—there! As if the little cherub would assure me of his encouraging applause for the bold stroke he suddenly gave a clear shout and accompanied this manifestation of pleasure with a dart towards his photograph. At that instant my deep bass must have harmonised but ill with the child's beautiful clear treble. Startled, I clap on the cap and retreat to my den, covered with disgrace. Here the slide is opened with more than ordinary haste. A few yards distant the flame of a stearine candle illuminates the scene. Yes; but what is to be done now? My kingdom for—a word of good advice! Ought I to spend the few minutes that yet remained in developing this much under-exposed plate? or would it not be better to prepare a second plate as quickly as possible? Meanwhile the late summer night has let its dark mantle fall deeper and deeper "over the just and the unjust."

Oppressed by the consciousness of this fact I grasp, more mechanically than as following a deliberate conclusion, the glass containing the iron and pour the contents over the plate. An unlikely thing now appears; I do not believe my eyes as with passable regularity of massing a certainly slightly foggy, but completely detailed, picture developes! I was as innocent as ignorant of the cause of this fortunate termination of the affair. It happened many years ago, and all my endeavours to solve the riddle were but loss of time and trouble. The following day my chemicals worked in the usual way, just as they had done before. One friend to whom I related the circumstance appeared to doubt my sanity, another looked at the ground during the relation as if he were ashamed; and, had not the *corpus delicti*—the under-exposed negative—been in my possession, I should soon have begun to doubt myself whether the thing had really happened as I believed, or whether I had not either imagined it all, or allowed some change or inexactitude of observation to slip in.

Was it not really very stupid of me not to get upon the right track immediately? Will the unfriendly reader, who thus reproaches me, consider that there are many problems which are easily understood when once they have been solved; but both time and patience are required to find that solution, and everyone has not sufficient discernment to pick out the seed of truth from the mountain of possibilities. That I did not at once find the explanation will be no subject for reproach with those old professional photographers to whom the necessity for experiment in the lighting of daguerreotypes is known, and by whom its possible application to the collodion process was long allowed to remain unverified. In the hurry of one's daily business one's best friend may pass unrecognised. Latterly, when after-lighting began to be talked of, I recalled my experience, and it occurred to me that perhaps the light of the taper had matured the negative, and my immediate impulse was to try whether this supposition did not contain the answer to the riddle.

Then Gutzlaft's admirable experiments were published, in which he obtained effects, though somewhat foggy, of the action of light through red and yellow glass and through solutions of carmine and cochineal, getting favourable but "by no means sure results" with solutions of certain bichromates, and no results with a combination of red and yellow glass. His theory was that an after-lighting of from thirty to forty seconds is advantageous, but that a minute is a maximum which should never be exceeded.

Then came the interesting observations of M. Melchion and Herr Fritz Haugk. Both employed ground glass and a white light placed in front of the aperture of the objective with good results—the latter before, and the former after, the special exposure. Herr Haugk's experiments with red and yellow glass were also useless. M. Melchion used a second twelve-per-cent. silver bath before developing, which he believes plays an important part in shortening the exposure. I may remark, *en passant*, that I am not quite clear about the effect to be attributed to the pre-lighting and the second silver bath respectively.

In another direction, yet related throughout to the foregoing observations, on the occasion of a discussion as to the means of restoring pictures which had lost their tone and were fugitive in the greys, Herr Luckhardt said he had remarked that by placing an oval cut out of white cardboard between the lens and the object the exposure might be shortened, owing to the light reflected from this screen to the lens.

I made a number of experiments in the various ways already enumerated; some of them confirmed the experience of these experimentalists, others yielded results which did not vary in exactly the same particulars, but in a new point with a more extended application. Indeed, I found that all kinds of light could be employed to assist the lighting—even white and blue if it be not too intense, when it would be apt to cover the whole picture with a thick veil of fog before the after-illumination has had time to show itself. This danger is greatly increased in proportion to the actinic power of the rays used in the pre- and after-lighting and the time they are allowed to act. It will be evident to everyone, since such a light must act upon the entire exposed surface of the plate, that the places where the shadows are deepest must remain distinct and clear. Carmine, then, green, and greenish-yellow are excellent; but when grey, blue, and violet rose and white are used the desired after-help is accompanied by a more or less undesirable degree of fogginess. But we already know many other ways of providing ourselves easily with this, and if the after-lighting method should be generally adopted I shall be obliged to propose an urgent motion to this effect:—Although he always exercises his honourable functions with great munificence and for the general happiness, yet, in consideration of this, the blonde god of Delos is hereby declared to be deprived of his supremacy over us, and——possibly the late Herr Leopold will turn in his grave, as henceforth fogs will be permanently cleared up.

*(To be continued.)*

## SILVER OR CARBON?

I AM old enough to remember the first exhibition of the London Photographic Society, and the intense interest it excited. *Savants* from all parts came to see it and the public in crowds, and nothing but words of joy and hope were uttered. It paid well. At somewhat uncertain intervals the Society from time to time opened its doors during many years, and often some special characteristic gave importance and significance to the year. There was the honey process year, the Taupenot year, the Fothergill year, the tannin year, the alkaline gold-toning year, the Salomon year, until, coming to modern times, there have been the Crawshay years. Now we have, *in propria persona*, the carbon year. "What a lot of carbon work!" exclaims the visitor. Just so; let me analyse it and speculate briefly on the future.

Are we to print in carbon or silver? Are our prints to be fleeting or permanent? As I look round, I see at once that carbon is used almost exclusively for enlargements; indeed, I believe the two very grand silver enlargements by Captain Abney, of Egyptian subjects, are the only silver ones, and, hanging close by the side of carbon prints, offer good comparison.

Captain Abney's pictures are in a rich, warm, transparent chestnut brown, such as no carbon prints are yet produced in, whilst the pigment pictures all over the room are in a somewhat heavy, slaty colour. Now, why should this be so? The tissue known as "auto. brown" gives a far more artistic and pleasing print than most of these—very nearly the tint of Captain Abney's. Portraits direct are not offered in carbon, except by M. Lambert and by Messrs. Spencer, Sawyer, Bird and Co.

Of the admirable suitability of carbon for enlargements no doubt can be entertained. But I now come to the next questions—Can portraits be printed in carbon? Can the daily work of a large business be done in carbon so as to equal in appearance silver printing?

Now, it is a remarkable fact that just as silver printing is threatened with "disestablishment" it sets its house in order, and effects such improvements and gives such promise that delay is asked for execution. I who write these words have seen the work of MM. Geuzel Freres and M. Deron, of Brussels, who issue solely in carbon; also those of M. Ganz and M. Dupont, of the same city, who issue, and intend to continue to issue, in silver. When one has claimed permanency for carbon, its sole claim at present for small, direct portrait use has been stated. There is a sad want of that rich, transparent warmth characterising the best quality of silver work. All the collodion films in the world cannot yet give it to carbon until a less opaque tissue be furnished. Without this collodion film small carbon portrait work is lustreless and dead; whilst with it a most objectionable kind of glaze is given, very different to albumen paper. If the so-called "matt surface" be given it looks like leather.

Now for the remedy. Every careful photographer in England keeps his eye on these matters because he wants at the earliest moment to print in permanent pigment, and the very moment it can really be done is ready to do it. The pictures now issuing in small sizes are not satisfactory in quality. A recent writer has said that the reason photographers do not go in for carbon is from conservatism. How little can a person who says such a thing know of those he addresses! All are looking out most eagerly for the advent of practicable carbon printing. It is extensively used now for transparencies, opals, ivories, and enlargements, and it is wanted for portraits and landscapes, in connection with which the following are the stumbling-blocks:—

First: Vignetting.—On silver one gets such exquisite results that we can accept nothing second-rate.

Second: The difficulty of the double transfer.—Let a good, practicable outlet from this be discovered and it will be a great point. Reversed portraits, &c., can be done as laboratory experiments, and copies of pictures, &c., by the prism, but this is not applicable to studio work.

Third: The difficulty with which desired effects are produced in printing when only a small number are wanted.—Printers know that during printing they open the frame, and put a cloth, a bit of wood, or a piece of paper over some part to shade it during printing; but the carbon is a "dark process," and this can only be done by guesswork. In enlargements it may be effected, but not in *carte* or cabinet sizes, with the certainty of silver, for the simple reason that you cannot see it.

Fourth: the exposure is quite double that of silver, and the manufacture a close monopoly.

Fifth: the choice being only between the dull, opaque print and the leathery or highly-glazed surface—all most objectionable and inferior to silver.

For copies of engravings, enlargements, and works for publication in quantity, carbon is unequalled and permanent beyond doubt; and the object, more than any other, of this communication is to invite those who alone have the manufacture of the tissue to give the public full practical details in a working form for business use, and tissues of such a character that can be really worked. All are deeply interested, and admire the energy and pluck of those who venture to send out portrait work in carbon in small sizes; but, as all know that the same negatives would yield better pictures in silver, the public are not satisfied. AN OLD PHOTOGRAPHER.

[As a commentary on the above communication we shall make a simple statement of fact. To such a degree of perfection has carbon printing recently advanced that in one large establishment—that of Messrs. Jabez and Alfred Hughes, of Ryde—*silver printing has been altogether discontinued* for nearly three months, carbon printing having superseded it, even for *cartes*, cabinets, and other work of small dimensions. Again: Colonel Wortley, a few days ago, called to show us a picture of a marine subject which he had just printed in carbon; and directed our special attention to the fact that in the breaking waves there was a degree of transparency and liquidity—so to speak—that he had never previously been able to obtain when printing similar subjects in silver. These two facts—for facts they are—must be kept in mind when reading the remarks of "An Old Photographer."—EDS.]

## FOREIGN NOTES AND NEWS.

A NEW PHOTOGRAPHIC JOURNAL: RETOUCHING VARNISH; TANNIN-SOLUTION CLEARER; TO REMOVE SILVER STAINS FROM CLOTHING; A PLATE-HOLDER.—DEVELOPMENT WITHOUT PREVIOUS ILLUMINATION.—THE ADHESIVE POWER OF GLUE.—ARRANGEMENT OF A STUDIO CURTAIN.—THE CENTENARY OF A GERMAN FIRM.—CONCENTRATED ALBUMEN.

WE learn from the *Photographisches Archiv* that a photographic society has been formed at Toulouse, and that it issues a journal, increasing the number of photographic journals published in France to four, namely, *Le Bulletin de la Société Photographique de France*, *Le Moniteur de la Photographie*, *Huberson's Journal de Photographie*, and *Le Bulletin de la Société Photographique de Toulouse*. If we may judge of the new journal by the following extracts, which appear in the *Archiv*, it deals largely in "wrinkles":—

"The following varnish poured upon the gummed collodion film greatly facilitates the pencil retouching:—

| | |
|---|---|
| Ether | 100 cubic centimetres. |
| Shellac | 1 gramme. |
| Sandarac | 6 grammes. |
| Mastic (in tears) | 6 ,, |

After these have been dissolved and filtered add ten cubic centimetres of benzine (not petroleum benzine). When poured cold upon a glass plate a dead film is obtained with this varnish. Should the grain not be fine enough add a little more benzine. This film can also be used instead of ground glass for focussing and transparencies.

"*To Clear Tannin Solutions.*—Soak some kaolin for a quarter of an hour in a mixture of one part of nitric acid to nine parts of water, then wash well with distilled water, and let dry. This purified kaolin will very soon remove discolouration from and clear the most concentrated tannin solution.

"*To Remove Silver Stains from Clothing.*—This process is most effectual when applied to materials which have already been washed several times. Prepare a saturated solution of chloride of copper, dip the stained piece into it, and allow it to remain in for a few minutes, more or fewer according to the intensity of the stains; then rub the spots with a solution of crystals of subsulphate of soda in a mixture of equal parts of water and ammonia. If neutral chloride of copper be used the colour of the stuff will not be changed in the least, and the process can be repeated."

The last extract given is upon holders for plates during the developing:—

"To hold the plate in the hand during developing is not only a certain way of covering the left hand with ugly stains, but is also a continual source of irregularity in the development. Many methods of avoiding this evil have been proposed from time to time, but none of them appear to us to be free from faults. The four-cornered frame and the pistol-shaped holder allow so much of the developer to be wasted that one has to pour two or three times the necessary quantity over the plate; and the pneumatic holder in warm weather causes a transparent circle in the centre of the plate. Our contrivance is simpler and better. We take a cardboard tube, eight centimetres in diameter and twelve long, open at both ends; this we coat completely with shellac, marine glue, or hard varnish. The plate is laid upon this tube, which can be held comfortably in the hand. The advantages of this cylinder are that, as it is open at the ends, there is no circular mark; and as the edges of the plate are quite free no more developer need be poured on than is required to cover the plate."

The principle of this holder seems to be identical with that recommended in Dr. Nicol's *Notes from the North* in THE BRITISH JOURNAL OF PHOTOGRAPHY for August 27, in which he recommends a penny jug as a plate-holder.

In the *Archiv* of the 12th October Dr. Liesegang tells a rather curious tale which he calls the *Development of a Picture Without Previous Illumination.* He says that a carbon picture (a portrait), developed upon glass, was allowed to lie a long time upon a dish containing hydric fluorine and sodic fluorine. The result was that the entire drawing—not only the high lights, but all the tones—was delicately etched in. After every particle of gelatine had been removed and the plate cleaned with *papier Joseph* it was floated with iodised collodion, silvered and covered with developer. Gradually a true negative picture of the etching developed itself; but this picture, consisting of silver with a metallic lustre, was neither upon nor in the collodion film, but between the film and the glass, so that it still remained unaltered on the glass plate after the collodion film had been washed off with ether and alcohol. Reduction had also begun in the rough places of the glass. The stains which appear upon imperfectly-cleaned glass plates are, likewise, silver deposits between the film and the glass, and are best seen from the glass side. So says Dr. Liesegang.

In the *Moniteur Industriel Belge* Dr. Karmarsh makes some remarks upon the adhesive power of glue. After a long series of experiments he finds that glue has a far more powerful hold upon surfaces of wood cut across the grain than on those split with the grain, and that when two surfaces of split wood are laid upon each other the adhesive power of the glue is the same whether the fibres be laid parallel to each other or crosswise. The adhesive power of glue on different woods, calculated in kilogrammes per square centimetre, is as follows:—

| | Cut Across the Grain. | Split. |
|---|---|---|
| Beech | 155·55 | 78·83. |
| Oak | 128·34 | 55·16. |
| Hornbeam | 126·50 | 79·16. |
| Fir | 110·50 | 24·16. |
| Maple | 87·66 | 63·00. |

One kilogramme per square centimetre is about equal to thirteen pounds per square inch.

Herr F. W. Wilde, of Görlitz, who sets great value upon a curtain as an accessory in portraiture, has sent to the *Photographische Mittheilungen* a minute description of a contrivance he has found very useful in moving the curtain in his glass house. Two rods are suspended from the roof of the glass-house six metres apart and some seventy centimetres from the background. The upper ends of these rods are firmly fixed to the roof, and to their lower extremities two small, horizontal bars, sixty-two centimetres long, are attached, so as to be capable of each describing a circle of 124 centimetres diameter, having the lower points of the rods as axes. To the free ends of the horizontal bars a round, polished, wooden curtain pole, whose length (six metres) corresponds to the distance between the first pair of rods, is fastened by a strong metal ring at either end, and from the pole the curtain itself is suspended by means of brass rings sewn to its upper edge at intervals of fifteen centimetres, passed over the pole, and left free to slip from end to end of it. By this arrangement the curtain has two motions, so that it can be placed either to the right or left of the sitter, and drawn either nearer to or farther from the background. The side motion is double—first, the curtain can be pulled entirely to one end of the pole; then it can be moved an additional 124 centimetres to the same side by means of the connection of the pole with the horizontal bars, whose movement it must follow. The back-

ward or forward movement by which the curtain is brought into the same plane as the sitter is gained by pushing the horizontal bars in the desired direction backwards or forwards, instead of to the side, as in the first instance.

A few weeks ago the centenary of the firm of Gustav Kühn, Neu Ruppin, of which firm Herr Gustav Kühn, jun., the photographer, is a member, was celebrated by a grand *fête*. On this occasion His Imperial Highness the Crown Prince of Germany presented the firm with a large gold medal, having a portrait of His Imperial Highness on one side and on the reverse the inscription, "From 1775 to 1875." At the same time His Royal Highness the Grand Duke of Mecklenburg Schwerin conferred the gold cross of merit of the order of the Wendisch Crown upon Commissioner Kühn, and the silver medal of merit upon the seventy-two years' picture-painter, Wartenberg.

It is almost impossible to form any conception of the vast quantities of eggs annually diverted from the food market to be consumed in the preparation of albumen, the yolks of which are completely wasted. Many persons assert that the great increase in the price of eggs of late years is to be attributed in no small degree to the enormous increase in the demand for albumen, a large proportion of which is used for photographic purposes; and some have even produced statistics in support of this view. Be that as it may, there can be no doubt that there is room for the introduction of albumen in a more portable and durable form than that in which it is at present obtainable, and photographers will certainly make no objections if food economists also profit by the by-product—or rather, in this case, the co-product—preserved yolks.

Desiccated albumen has for some time back been much more extensively used by photographers on the continent than in this country, and we learn from the *Deutsche Industrie Zeitung* that eggs preserved in the shape of concentrated powder, without the admixture of any foreign body, are now in the market. This preserve is prepared at Herr von Effner's establishment at Passau, and is obtainable in three different forms, namely, whole eggs, desiccated and pulverised, yolks and whites treated separately. One volume of egg powder, which retains in a great measure the natural colour, taste, and smell of fresh eggs, well mixed with three volumes of clean, cold water, produces an emulsion which in appearance is almost identical with that of a freshly-whipped-up egg; but the froth is scarcely so strong nor so durable.

This preserve of eggs can be used for every purpose—for example, in the preparation of omelettes and pancakes, pastry and confectionery—the same as fresh eggs; but the colour of the baked meats is almost white, and when the froth is the principal thing it is better to add some fresh egg to the preserve. The yolks alone require only two teaspoonsful of water to one of the powder for the preparation of the emulsion, while the concentrated whites require six teaspoonsful of water to one of the powder to produce the same consistency. As solutions of albumen of various strengths are required for different purposes it is impossible to prescribe any exact quantity of water. For photographic purposes a solution of albumen requires to be as clear and pure as possible. To bring it to this condition a little ammonia or some similar chemical is generally added, which is apt to make the solution turbid when it is diluted with spring water; in that case distilled water must be substituted for dissolving the powder.

The dried albumen can also be used for all industrial purposes for which albumen is employed, such as in albumenised paper establishments, in calico mills, and by gilders and gold-beaters. The contents of a package of whole eggs, powdered, weighs 280 grammes, and costs about one shilling and eightpence. A package of powdered yolks weighs 280 grammes, and costs about one shilling and sevenpence. A packet of concentrated albumen weighs 500 grammes, and costs about five shillings in pieces, and five shillings and threepence pulverised. According to Gobley and Prout the yolk of an egg contains 52·65 per cent. of water, and, if a hen's egg, weighs on an average about fifteen grammes; the white of an egg contains eighty-seven and a-half per cent. of water, and weighs about twenty-eight grammes. From these data the average number of eggs that go to a packet of yolks and whites respectively can easily be reckoned.

Dr. J. Schnauss has already applied this concentrated albumen to the purposes of photography, for diluted solutions such as are used for preliminary and upper coatings for dry collodion plates, and speaks very highly of it in the *Archiv*. The great advantage of it to the photographer is that of having an undecomposing albumen always at hand which can easily be dissolved, and the solution of which keeps for several days.

## OUR CLUB.

### No. XIV.—Tom's Party.

"So! pass the bottle round!" cried Tom, as he sat, for the time being, at his own table like a king bestowing the good things of this earth on his subjects, who, with glowing faces and light hearts after a good day's trade, were not loth to partake of the same. They partook as freely as it was given.

"And now, lads," Tom said, "since we have enjoyed a drink and a song, what do you say to a story? I think that each of you can tell us some of the little experiences which must have crossed one and all of you as you have gone rolling along, and which must be amusing if not edifying. You know to a great deal of work we require a little play; so, old Hardhand, you begin with some of your life passages."

Here the chorus of glasses dinted the mahogany by way of applause.

"Well, I don' know as I have to much tell," began old Hardhand; "but when a young 'un I fancy that I was rather a smart lad." The hard furrows on his face gathered together like the closed bellows of a camera, and his mouth expanded to make room for the "Ha! ha! ha!" which issued forth. That laugh would have done credit to the "heavy villain" of the drama.

Tom termed the performance "a winning smile." Hardhand continued:—"Most of ye know me off and on these fifteen years, but afore that time I was well to do. I had a studio on wheels then, and a horse and a dog, and all my own; but they have melted away, lads, and I'll tell ye how they melted. I did very well in them days when every ray of sunshine brought a shilling like. Talk o' your *cards de wisit!* What are they wi' their printing and washing and toning and fixing and all the flummery that they talks and writes about! I say give me a good glass picture wi' its fine lights and shadows, and the soft, pretty finish that comes to it quite natural like. None o' you're touching up and touching down for me, wi' your paper on the back and paper on the front and paper sideways, till nature is so rolled up and worked out that it is quite lost to the world. And besides, lads, it is far easier to give the right thing just as nature sends it rather than them cross-bred productions between a Faber's pencil and a cake o' China ink!

"But I'm forgetting my story. Well, I was just getting on first-rate wi' my van and my dog and my horse when my brother Sam came home from abroad somewhere. He came from a place like something for eating—Sandwich; yes, that's it. And it must have been up a good way, for he said there was a group of highlands. No matter. He wanted to join me, and as I had plenty o' work for both I took him in and he did for me. Look here, boys!" he said, in a whisper, and bending forward; "Look here! Never trust your relations. No good can come of it. Don't do it. Now that's a straight tip for ye!"

Then he continued:—"By and by he got the upper hand o' me like. No matter how I tried he would be master; and I believe he even turned my dog against me. I'll tell you why I think that. One night, when I was away avisiting the girl I loved, I was very late of coming home, and the van was shut up. Knock as I liked I could not get Sam to hear me. At last I thought of a shutter at the back that I could pull down and get in. So round I goes and pulls down the shutter, and there stood the dog agrowling at me! 'Bob!' I cries, 'it's your own master, sir;' and I put up my hand to see if he would bite, but he only licked it all over. All right, I thinks, so I up with my leg, when he gives a growl and a spring. I wasn't long agetting out o' that, and as I strutted about in the cold till morning I felt awfully shocked at one's own flesh and blood going against one so; and I had reared that dog from a month old.

"Sam preferred taking drink to taking pictures, and he became an awful drag upon me. He didn't do any work, and he just 'collared' as much 'tin' as he could lay his hands on. Being always drunk and ahanging about the door, trade went bad. That same dog o' mine took to most depraved habits, too; he never was out o' the 'pub.,' and revelled in sawdust. I gave them both up for a bad job. So I determined in my mind to slip them during the night and to be nowheres seen in the morning, which I did; but it wasn't a bit o' use. If me and my van had been at the bottom of the deep blue sea I really believe that dog would have come down in a diving-bell a-sniffing me out.

"'So you were trying to dodge us,' said our Sam in his sneering way; and, mind you, he came home in his shirt-sleeves, having left his coat wi' his uncle. 'So you were agoing to dodge us,' he repeated; 'but we have dogged you. Not a bad joke, eh? You began it,' he continued, getting into a rage; 'but, mark my words, I'll finish it for you.' So away he goes to a magistrate and swears the van was his, and that I had stolen it from the last town. He was a ''cute' one. You see I came away in such a hurry and excitement that I never once thought o' going to pay for the ground-rent for my van; but Sam did. By some means he got the money, and held the receipt *in his own name.* I was brought before the magistrate on the charge, not knowing anything about this receipt. So the magistrate asked me my name. I told him; when, turning to the clerk, he said:—'That's not the name of the proprietor. It's a case of theft as clear as sunlight. You must detain him for further investigation.' So I was detained. I was like one with the nightmare. I couldn't speak, and they took me away to a cell. Sam went away home to the van. He didn't try to move it; but he did

worse—he sold it to a wax-work man that very day. I was brought up for trial. No one appeared against me, so I got off; but my van was gone, and my heart was broke. I got as much money scraped together as hired me a tent, and I again started the glass pictures, always making a living. Sam died within eighteen months in a madhouse; and so ends"——

"The story of a brother's love," said Tom.

Hardhand took a deep drink to drown his woes.

A man named Moorhouse now stood up and said:—

"Mr. Chairman! If the company have no objections, I will relate an incident in my professional career which was so startling at the time that my nerves quiver when I think of it now."

I could see from the way that he announced his intention, and the hush that came over the company, that he could tell a story with effect, and that this had not been the first time the company had listened to him.

He began:—"I remember that morning, ten years ago, when Sinton entered my studio to have his portrait taken. He was a tall, gentlemanly-looking man; but he wore a peculiar suit of dark grey, and a peaked cap of the same material, which made him look rather odd. He had an uneasy roll and twinkle of the eye, and a rambling manner in talking which I did not like."

"'Take pictures here?' he said. 'Will you take mine? I don't care whether you do it or not, you know, for I can take my own picture. I can photograph in the dark, sir, I can.' And he chuckled to himself—an inward chuckle, as if he were delighted with himself.

"'Oh! yes, sir,' I replied cheerfully. I did not really know what to make of my early visitor, so I tried his own humour. 'A beautiful morning for a picture. Shall I take you now?'

"'What else do you think I came here for,' he replied, his eyes flashing and looking round suspiciously. 'Do you think I'm mad?' he said, fixing his eyes on me.

"'Certainly not,' I replied (that was a lie—I did think he *was* mad); 'but I thought that perhaps you came to make an appointment.'

"He seemed to take no notice of my reply, but his eye was attracted by something he saw on the floor. So he walked forward to it and picked it up. It was the iron rod of an old head-rest which had been thrown aside as useless. He balanced it in his hand for a moment or two as he muttered between his teeth—'A glorious weapon in a fight! Close quarters and a good swing and I'd bring down my man!' and, swinging it round his head, he said—'It's better far than a pistol.'

"I stood still and gazed with inward terror. I feared for myself and everything in the place.

"He threw the rod on the ground with a laugh, saying—'I love sport.' His idea of sport struck me as strange.

"'Will you take this seat?' I said, placing a posing-chair in front of the rest. 'I will take your picture.'

"'And why do you want to take my picture?' he exclaimed, with a suspicious flush of the twinkling eye.

"'Because you yourself desired it,' I said, with a laugh. It required some effort to get up that laugh.

"'Oh! so I did,' he said. 'I remember, a long time ago;' and he sat down quietly.

"I had no sooner placed the rest to the back of his head than he started from the chair with an oath, his face and hands working convulsively. He exclaimed—'No! no! none of your irons for me, sir. Six men such as you could not fix me in them. If I thought you meant to play me false I'd dash your brains out where you stand!'

"I stood aghast. I couldn't move. It was no playful banter. To look upon that face showed dead earnest. In the excitement of the moment I explained hurriedly—'Why! it is only to keep your head steady! A rest is necessary.'

"'Yes; a rest is necessary,' he repeated, dropping into the chair; 'but the only place to find it is in the grave.'

"'I will go and prepare a plate,' I said, now he was quiet, and I was eager to get out of the room. He sat still, heeding me not, so into the dark room I went and locked the door. Now I could breathe more freely. There was a small perforation in the wooden wall through which I could see what was going on in the studio. I applied my eye to the hole to see how my subject was getting on. I saw him look stealthily round, and then, rising, he slipped like a cat to where the iron rod lay. He quietly wet both his hands with his tongue, and noiselessly rubbed the palms together; he then took hold of the iron rod by one end and swung it round his head. He came forward to the edge of the dark-room door, and there he stood and listened. He then raised the rod above his head and stood there in silence, evidently waiting till I would come forth to cut me down.

"I stood there with only a thin board between us, my nerves unstrung and my head light. The fact is I was frightened to death. I had a door from the dark room into the lane, which in my momentary excitement I had forgotten. I resolved to run away. I opened this door quietly to slip out, when I started back on finding two men standing against it as if listening. My surprise was but for an instant, for I recognised one of the men as our constable and the other as one of the keepers at the asylum.

"'We have tracked him here,' they said at once. 'He is a most dangerous lunatic, and has just escaped from the asylum.'

"I was thanking myself inwardly that I had just escaped from death, when the keeper said—

"'You must go back again, Moorhouse.'

"'Go what? no fear of me!' I said, with determination.

"'He won't harm you,' he continued in a persuasive tone. 'It's the only chance of saving your studio and the things in it, and it's the only way we can catch him.'

"I brought them into the dark room and let them see through the hole. He was sitting quite quietly now. The keeper whispered—'Go take his picture now, and during the time we will enter and seize him.'

"Needs must, and the sooner the better. Out I went at once with the dark slide in my hand. He no sooner saw me than he sprang from his seat and seized the end of the rod.

"'No; you don't!' I said, putting my foot upon it, when it left his fingers and came to the ground with a crash.

"'Ah!' he said, with an oath and his eyes flashing with rage, as he seized me by the throat, 'so you have betrayed me, have you?'

"And with one twist from his powerful arms he sent me crash against the other side of the studio, and again he made for the rod; but the keeper was too quick for him. He was down on him in a moment. At last there was a rope twined round and round his arms, and thus he was rendered harmless. It was a desperate struggle between those three men—not long, but fierce. I never think of it yet but my blood creeps."

So ended Moorhouse's experience. MARK OUTE.

## CULLINGS

### FROM THE SIXTH CONVENTION OF THE NATIONAL PHOTOGRAPHIC ASSOCIATION OF THE UNITED STATES.

ELIMINATING HYPHOSULPHITE OF SODA, AND WASHING PRINTS.—M. J. R. CLEMONS: I have not had very good health the past year, and, of course, I have not experimented a great deal, but I think what I have done will be of benefit to those who are in places where water is not easily procured. This is what I mean—the eliminating of the hypo. from the print, which can be done readily and better than by any other process which has ever been presented; at least I think so, or, at least, my work shows what I have done. I have prints with me that were taken from the hypo., and in eight minutes they were placed upon a line to dry. They were tested then by the iodine test as to whether there was any hyposulphite of soda present, and they gave no reaction whatever. I had a notion to keep that for a gold medal next year (laughter), but it says it must be within the year. I have also got a silvering process. Now, all those who are troubled with the yellow jaundiced paper hold up their hands, and I will give them a cure. (Hands held up.) Here is one. This print evidently has been in the acid; it has a bluish appearance or a yellowish appearance. This is not universal. It is usually from cyanide on the fingers while the print has been put into the wash, or else there has been hypo. left in the dish—either cyanide or hypo. I can produce that every time without half trying. The next thing is that the print has not been thoroughly washed before toning. In a case of the kind mentioned the paper will apparently keep white until it is dry and mounted, and sometimes when thoroughly washed it will keep white several days; but when the light is turned on the prints they will begin to turn yellow like that. They require more toning before washing than after. Now I will tell you why. If you get your prints thoroughly washed before you commence to tone no light will ever change them; but the free nitrate of silver must be thoroughly washed out before you tone. As for the hypo. I contend you cannot get it all out. The material itself has an affinity for it. There is an easy way to prove that the materials have an affinity for hypo. by taking your line on which you hang your prints and testing it for hypo.; you will soon see how bad it is, because it has an affinity for hypo. I take the paper and pour a little iodine on it; it will turn blue if there is any hypo. It will fade it very rapidly. The water will fade it. Take the same paper, put it into the air, and see which fades the first. That will tell you to a nicety. That is the way we did. Then you take a piece with the hypo. on it, even if it be no bigger than a pin's head, and put it into a barrel of water; by putting iodine in the water you see it passes off very freely.

Q. Tell us how you wash a print?

MR. CLEMONS: I guess some lady would laugh at me if I should tell them. I went through a series of experiments after reading a good bit on the eliminating of the hypo.; that is, expelling the hypo. from the print. I had tried the *Lea process.* Of course you can cure the print that way, and if there happen to be any blisters in that way, you have it in a mixed form. You do not get it pure and clean, so I take a saturated solution of alum and that is all that I use. The prints which I will hand round were toned the first of last September. I first take them right from the hypo. and place them in the alum solution. I leave them there a few minutes, wash them off, and place them in the alum again. I leave them two minutes. Wash them slowly a third time, place them in two minutes more, merely rinse them off and hang them on a line, only occupying eight minutes in it. To those who have not got a great deal of water in certain sections of the country I will guarantee this

way; but if you suspect hypo. you have got to test any way, and you can place them in again. I have tested them after being washed a quarter of an hour, and there was not a sign of any colouration in them or any chemical.

Mr. Lee Knight: I would like to ask Mr. Clemons to state what the action is, if there be any, of the concentrated solution of alum in changing the tone of the print. I have had some that had the appearance of being over-toned. I do not know whether they are all so or not. I wish to ask whether the tone is affected by the action of alum in the water?

Mr. Clemons: I stated that these were toned in a suspended gold bath. I placed these in a gold bath, washed them a little while, found there was a slight action, left them to attend to some other duty, afterwards examined them, and found they were toned enough; that is the way it was. You know, in toning, oftentimes some prints will tone faster than others, from some unaccountable reason. I have toned thousands and thousands of prints, and found that to be the case.

Mr. Cross: I would like to ask Mr. Clemons the best remedy for yellow paper in hot weather?

A. Take thirty-two ounces of silver and pour out four of that into a separate vessel; take some clean cyanide solution, and add to that two ounces until you make a precipitate, not until it redissolves. It will redissolve the same as ammonia. You take that, and add it to the thirty ounces; you shake that up thoroughly, and leave it to stand all night, and you will find a precipitate at the bottom. Now it can't get there by filtering. What you have filtered you make slightly acid, and then the paper will keep two or three days, such a day as this (a very warm one), in good printing condition, without losing any sensitiveness; that is better than having two or three batches of citric acid and silver. Have you all got it? Have you all heard it? You take thirty-two ounces of silver, or that proportion, all the way down.

A Member: Some of us are using double glazed paper, and are troubled with blistering. Some of us I do not think got a clear idea from you remarks as to the use of alum. You say, to prevent blistering, use an alum bath after the hypo. My experience is that blisters form in the hypo., owing to the difference between the temperature of the hypo. and the water. Now I do not understand why you should use an alum bath to prevent blistering if blistering occur in the hypo.

A. Blisters come from the double albumenised paper. It does blister if the double albumenised paper be used. It takes up silver; forms it in the paper. You put that into the hypo., there are no blisters formed there. It is from the action of the air; when you expose it in the air it blisters. That is my experience. I will guarantee that, if you put it into a saturated solution of alum, there will be no blisters formed.

# Meetings of Societies.

## MEETINGS OF SOCIETIES FOR NEXT WEEK.

| Date of Meeting. | Name of Society. | Place of Meeting. |
|---|---|---|
| November 9 .. | London ........................ | 9, Conduit-street, Regent-street. |
| ,, 11 .. | South London .................. | Society of Arts, John-street. |
| ,, 11 .. | Manchester..................... | Memorial Hall, Albert-square. |

## LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The usual monthly meeting of this Association was held on Tuesday evening, the 26th ult., at the Free Library, William Brown-street,—the Vice-President, Mr. W. Atkins, occupying the chair.

The minutes of the previous meeting were read and passed.

It was proposed by Mr. W. H. Kirkby, and carried—"That each member shall be expected to present yearly to the Society's album at least one photograph. The photographs to be submitted to the Council, who may reject any they do not think worthy of a place there."

Some diagrams, illustrating the diurnal variations in the aggregate chemical force of the daylight of the southern sky, prepared by Mr. D. Winstanley, of Blackpool, were passed round for inspection.

In reference to the preparing of gelatino-emulsion plates, the Rev. H. J. Palmer recommended the members to follow the instructions given in an article on *Winter Employment for Amateurs*, which appeared in a recent number of The British Journal of Photography, page 483.

Some exceedingly fine views of Scottish scenery, kindly lent by Mr. W. Harding Warner, then engaged the attention of the members, and afterwards the meeting relapsed into conversation, adjourning until November, when the annual meeting will take place.

The Photographic Society of Great Britain.—The forthcoming Session of this Society is to be inaugurated by a *soirée* in the Gallery of the Society of Painters in Water Colours (in which this year's Exhibition is held), on Tuesday evening next, the 9th inst., at seven o'clock.

The South London Photographic Society's Technical Meeting.—According to previous announcement, the annual technical exhibition, or meeting, of this Society will be held in the large hall of the Society of Arts, on Thursday evening next, the 11th inst. It is understood that there will be a large collection of interesting objects exhibited and their nature explained. Photographers generally are invited to attend.

# Correspondence.

## CANON BEECHY'S PROCESS.—KEEPING PROPERTIES OF EMULSION AND PLATES.

*To the* Editors.

Gentlemen,—Since forwarding my communication on the *Split Sunshade*, I have received last week's Journal, and feel much flattered in finding that my simple process has received no fewer than three notices therein. Let me first thank "A Harry B." for his approval, and assure him that if he have found the plates satisfactory in the way he prepared them, he will find them still better, more easily prepared, and more constant in quality if he will first be sure of his chemicals, and then make his stock bottle of bromide solution, using the exact proportions which I have given—dissolving the silver in alcohol, ·820. My letter in your last number but one will have explained any apparent discrepancy.

And now with respect to the keeping properties of the emulsion which "R. A." desires to ascertain: I must remind him and all your readers that in the exquisite plates of Colonel Stuart Wortley, of which mine form but a domestic and purely simple edition, the addition of uranium was expressly made to increase the keeping quality and add to the rapidity. But every addition adds to the amateur's chances of failure; and, short of such excellence as those delicate plates possess, the fewer the ingredients and the more simple the chemical combinations the greater is the assurance of keeping quality. Now this emulsion contains simply pure bromide and chloride of silver, with a little free nitric acid. Chloride of silver emulsion is known to keep any time, and I believe this emulsion will keep any *reasonable* period. Indeed I mentioned that I keep a stock bottle of emulsion into which I turn all the odds and ends which remain after making any batch of plates, and when I want to make only a plate or two for any experiment I just use a little of this, and though, if old, I give a little longer exposure I am not at all sure that they require it. But why try to keep emulsion when it is so easily made in a few hours? No emulsion gets *more* rapid by keeping, and it is very disappointing to come home from a trip and find all your plates under-exposed. By all means let "R. A." keep a little stock of emulsion, as I do; but whenever he is going a tour he should always make a fresh emulsion.

In answer to "Inquisite," I can really assure him that, if kept dry and dark, these plates will keep a twelvemonth at least. They owe this property largely to the beer preservative. It gives a glaze so delicate and pure as absolutely to prevent atmospheric influence; but damp, of course, will act upon this or any other preservative that I know of. I generally have a dozen plates or so in my box ready for any emergency; but, again I say, if you want to go out* with plates of the first excellence and rapidity make a new batch, and never make many more than you think you will want. Most people take out more plates than they use; put your overplus back in your box when you come home for the little store "Inquisite" desires. No plates are the *better* for keeping; time, certainly, deteriorates all. I found, the other day, a batch of Liverpool plates in their original package, unopened, about *six years old;* but by no amount of exposure could I get the least trace of a picture on them. They were made before Mr. Stillman's improvements. I can, also, give my plates an excellent character for keeping *after* exposure; but take Mr. M. Carey Lea's good advice, and always develope as soon as you can.—I am, yours, &c.,

*Hilgay Rectory, November* 1, 1875. St. Vincent Beechey.

## THE COMBINATION OF OIL AND WATER COLOURS.

*To the* Editors.

Gentlemen,—Will "Free Lance" allow me to give him a gentle hint to take care that he does not blunt himself by an indiscriminate tilting against everything that stands in his way.

In his first contribution he falls foul of me for lauding the effects produced by a combination of oil and water-colour in a painting which I had just seen. "Free Lance" does not seem to know—but of course that is not my fault—that some of our most popular artists have attained to both fame and fortune by such a combination; and if he will take the trouble to inquire in the proper quarter, he may learn that Turner is generally supposed to have produced most of his works in that style, and simply glazed them with oil after they were painted.

I may state that I have just had a conversation with a well-known artist, at whose works "Free Lance" would certainly not turn up his nose, and he assures me that he frequently has recourse to the combination of oil and water-colours with the best results. "Free Lance" would prefer a cheap German lithograph! Happy man! he may easily gratify his taste, and adorn his rooms with nearly a hundred of them for the price which the photographer in whose studio I first saw the combination gets for each picture, and I can assure him that the artist is making a good thing out of them.—I am, yours, &c.,

*Edinburgh, October* 28, 1875. John Nicol.

* If going *abroad* or very far before using, take the plates *quite warm* out of the drying-box into a dry and hot air-tight box. It is quite worth the while.

## TO REMOVE CARBON IMPRESSIONS DEVELOPED ON GLASS.

*To the* EDITORS.

GENTLEMEN,—Will you allow me to point out to M. Lambert's licensees, and to all who develope carbon prints on glass, that the nuisance of having to wax the glass by rubbing over the compound, then polishing off, &c. (all of which is voted by most people a nuisance), can be easily avoided by using a solution and proceeding as follows:—

Make a mixture of methylated ether, twenty ounces; bees'-wax, sixty grains. Scrape the wax to assist its solution; let it remain a day or two, occasionally shaking the mixture; then allow it to settle, and pour off the supernatant liquid. To five parts of benzoline add one part of this clear fluid and it is ready for use. Coat the plate as with collodion; it will dry in two or three minutes, and can then be collodionised in the usual way. Pictures developed on glass plates so treated never fail to strip perfectly.

If photographers do not choose to prepare this solution for themselves it can be had from my firm at a small price.—I am, yours, &c.,

*Autotype Works, Ealing Dean, W.,* J. R. SAWYER.
*November* 3, 1875.

## *CARTE* PORTRAITS.

*To the* EDITORS.

GENTLEMEN,—I congratulate your correspondent for so ably mentioning the above subject in a recent number. It is to be hoped that the hints will be taken up by some influential party, and, ere long, we shall have an exhibition based on the principle named, when prizes will be given for *carte* and cabinet-sized portraits.

I do not hesitate to say that it will be the means of raising the standard in that class of picture; besides, the successful exhibitors can command a better price for their work.

I would suggest that the Manchester Photographic Society, with its able members, should take this matter in hand.

Hoping that you will be pleased to insert this hint in your valuable Journal,—I am, yours, &c., RUSTIC.
*Compstall, October* 27, 1875.

## EXCHANGE COLUMN.

A good set of electrical apparatus, cost £3 3s. will be exchanged for a good card lens. Difference adjusted.—Address, J. BULMER, Post-office, Brora, N.B.

I will exchange a 10 × 8 Ross's medium-angle doublet for a rapid rectilinear, by Dallmeyer. Difference adjusted.—Address, N. GILLESPIE, Fivemiletown.

A good Lerebours cabinet lens will be exchanged for a French cabinet lens of short focus. Difference adjusted.—Address, JOSEPH SIDEBOTTOM, Compstall, near Stockport.

Wanted, a large, portable, outdoor studio, with plain background, in exchange for a large dark room on wheels, background on roller and batten, camera and lens, &c.—Address, J. A. LANGTON, Eglinton House, Broadway, South Hackney, London.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

K. W. W.—The patent has still a few years to run ere it lapses.

VISITOR.—The enamels which you admire so much were produced by the powder process.

WILKIE.—To prevent over-bronzing of the shadows of the prints reduce the strength of the silver bath.

S. M. B.—The writer of the work mentioned is in error in his statement about flare. This a matter that is susceptible of demonstration.

G. SPURRELL.—To prevent the veiling of the shadows add a few drops of tincture of iodine to the collodion. Let the quantity added be sufficient to cause it to become of a pale sherry colour.

CYNTHIA.—We are not aware of the process having yet been introduced into this country. As soon as this is the case an announcement of the fact will be made.

JACKOBURN (Bacup).—Our correspondent wishes some reader to inform him of the best way of "preparing enlargements on Whatman's drawing-paper for oil painting." He has tried glue-size, but cannot get such a smooth surface as he desires.

H. A.—See an article by Mr. Gough in our last number. One of the best stoves for warming a studio, of which we are at present aware, is George's calorigen. There may probably be several others equally effective, but we are not acquainted with their principle or construction.

LIVE IN HOPE (Hampstead).—If you are unacquainted with photography, and desire to acquire a knowledge of it so as to be able to make a living, the most simple, as well as the best, way of proceeding is to take a few lessons from a person competent to teach the art. How long it will be ere the necessary proficiency be attained will depend upon the receptivity of the pupil, combined, of course, with the ability of the teacher in conveying information.

G. H. S.—Owing to the proximity of the red tiles the light in your studio will be greatly lessened. A very considerable increase of light will be obtained if you remove the panes from the lower sashes and supply their place with ground glass. It is of no consequence how coarse the glass be; even corrugated or "rough" glass will answer the purpose. It will probably answer quite as well if, instead of removing the plane glass, you render it incapable of transmitting a direct ray by giving it a coating of a thin paste composed of powdered starch mixed up with *cold* water. The result of treating the lower panes in the manner described will be a great increase of light. What we have recommended applies only to those panes which are interposed between the sitter and the red tiles and wall.

A SUBSCRIBER.—It is somewhat singular that within an hour after receiving your letter announcing a failure we should receive a letter from another correspondent announcing complete success. The failure in your case may possibly be due to operating in a low temperature.

G. SIMMS (Leith).—The length of time that a glazier's diamond will last, or remain good, depends entirely upon the treatment it receives and the amount of work to which it is subjected. Any glazier in your locality will be competent to answer this question better than we can.

T. G.—Although the triple achromatic has been to a great extent superseded by other forms, yet, as we believe your lens of this kind to be an exceptionally fine one, we strongly advise you not to part with it until after a protracted trial of others you are quite satisfied of its inferiority to them.

C. B. A.—We reply to your queries as follows:—Spirit of wine sixty overproof is rather too weak to use in its present state. Extract some of the water from it by means either of the endosmose principle of proceeding or by the simpler method of bicarbonate of potash, as frequently explained in this Journal.

COLONEL YOUNG.—After carefully examining the lens we have arrived at the conclusion that it will answer very well for pictures 25 × 30 inches—subject, however, to one inconvenience, viz., slight over-correction for actinism. It is so well corrected for colour as to answer the purpose of an object-glass for a telescope; but this kind of correction is unfavourable to the obtaining of photographs by its means which will be sharp at the visual focus. After focussing sharply, draw out the lens from the gronnd glass to the extent of about three-quarters of an inch before taking the photograph. The precise amount of separation required must be ascertained by repeated trials.

H. L. writes:—"Referring to your article on the restoration of discoloured daguerreotypes in your issue of the 22nd inst., I may mention that I have one that has been so cleaned several times during the past twenty years, and now requires a similar operation. My object is to inquire if you know of any suitable varnish that would not destroy the picture, but prevent a repetition of the operation of cleaning after its having been once more restored. As this is the only one in my possession I have no desire to submit it to any bungling experiments of my own."——In reply: varnish of the kind known as hard, white spirit varnish, thinned to a considerable extent and then filtered, will answer the purpose intended.

COUNTRY PHOTO.—1. Not only do we *not* condemn the use of ground glass for the studio, but, on the contrary, have frequently strongly recommended it under certain circumstances.—2. By immersing glass in liquid fluoric acid its surface will be corroded and made rough, although the transparency will not be entirely destroyed. Exposure to the *fumes* of the acid will induce a *dead* surface like ground glass. By using the No. 3 toning bath given in our last ALMANAC (page 173) you will get the deep purple tones desired.—4. The varnish used on the slip enclosed appears to be at fault, *provided* you have heated the plate properly before applying it.—5. Do not add nitrate of barytes to your bath when it is in good working order.—6. We advise you to make your glass house with the sides parallel.

CAPTAIN WATERHOUSE.—Received.

PHOTOGRAPHY AT THE AMERICAN CENTENNIAL.—It is now decided that a photographic hall is to be erected in connection with the Centennial exhibition, subscriptions to no less an amount than ten thousand dollars having already been secured. The hall is to be eighty feet wide by two hundred and forty feet long. American photographers are greatly to be commended for the enterprise displayed in this matter.

## LONDON GAZETTE, *Friday, October* 29, 1875.

PARTNERSHIP DISSOLVED.

WARLICH and NIGHTINGALE, Grove-lane, Camberwell, and High-street, Notting-hill, photographers.

## METEOROLOGICAL REPORT,

*For two Weeks ending November* 3, 1875.

Observations taken at 406, Strand, by J. H. STEWARD, Optician.

THESE OBSERVATIONS ARE TAKEN AT 8.30 A.M.

| October. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 21 | 29·58 | S | 53 | 54 | 63 | 49 | Fine |
| 22 | 29·58 | SE | 52 | 53 | 57 | 48 | Cloudy |
| 23 | 29·42 | SE | 49 | 50 | 53 | 47 | Dull |
| 25 | 30·24 | SE | 41 | 43 | 55 | 40 | Foggy |
| 26 | 30·13 | SE | 42 | 45 | 53 | 41 | Dull |
| 27 | 29·79 | E | 41 | 43 | — | 41 | Raining |
| 28 | 29·86 | E | 45 | 47 | 49 | 42 | Dull |
| 29 | 30·08 | N | 44 | 47 | 49 | 44 | Foggy |
| 30 | 30·02 | NE | 40 | 44 | 47 | 42 | Dull |
| Nov. | | | | | | | |
| 1 | 29·91 | E | 43 | 45 | 48 | 41 | Dull |
| 2 | 29·88 | SE | 40 | 44 | 51 | 42 | Dull |
| 3 | 29·85 | SE | 49 | 51 | — | 43 | Dull |

CONTENTS.

THE BRITISH

# JOURNAL OF PHOTOGRAPHY.

No. 810. Vol. XXII.—NOVEMBER 12, 1875.

## HOW TO EXTEND THE CAPABILITIES OF A LANDSCAPE AND COPYING LENS.

There are few photographers who do not frequently feel the necessity for a far greater elasticity, so to speak, in the apparatus employed by them when out afield in the prosecution of their pictorial labours. This elasticity, or increase of accommodation and power, is especially desirable in respect of the lens employed; for circumstances very often arise which cause a lens suitable for the general course of work to become unsuitable on special occasions.

To meet the exigencies which thus so often arise landscape photographers now rarely go from home without more than one lens; for it is obvious that, if the object to be photographed appear too small and insignificant upon the ground glass when using a lens of a certain focal length, two ways only remain by which this dwarfed appearance can be remedied, namely, either by going much nearer to the object in question, or by substituting a lens of much longer focus for that by which the image was projected upon the ground glass. The former is often artistically impossible when once the view has been carefully composed and selected; for the perfection of the picture may depend upon the relation certain portions of the scene—such as rocks, trees, or foreground objects—bear to the main object, and the alteration of the point of view might be entirely subversive of such harmonious composition. The latter implies the possession of such a variety of lenses as will meet cases of difficulty of this kind as they occur. By far the best plan is for the tourist photographer to travel with lenses of various foci; for he can, under such circumstances, select his view with the greatest care without regard to the general capabilities of the lens, which he will then select from his stock with special reference to its peculiar attributes for accomplishing the work laid out for it by the photographer.

While such is the best mode of securing the object in view, it is, however, one in which the amateur of moderate means dare not freely indulge, on account of the large expenditure involved. It is our object here to indicate in what way the possessor of one good lens may be able to utilise it for divers kinds of work, by varying its focus within a considerable range, and thus producing a small, large, or medium-sized picture at will.

It is well know that any of the cemented, non-distorting combinations now so much used may also be employed in the single form; that is, the back or front lens of such a combination may be used alone. In this condition it is double the focal length of the complete combination, and covers a plate of twice the dimensions capable of being covered by the other; but when employed in this way it is not adapted, when worked up to its full covering power, for architectural subjects, owing to its curving the straight lines of the building delineated near the margin of the picture. When, however, skill is exercised this kind of curvature is not noticeable—a fact amply proved in a very large and excellent picture of *Kirkstall Abbey* we recently received from Mr. Wormald, of Leeds, in which, owing to his not having an objective of sufficient focal length, the posterior element of one of his combinations was pressed into service.

We shall now show by what means the focus of such combinations may be varied to a great extent without introducing any linear distortion; but before doing so we must remind the reader that the correction of a photographic lens is only a compromise, some inactive rays being brought to a focus along with those of most activity, although some of the latter class are left outstanding. We shall take as the lens on which the following experiments and remarks are based one of those now so well known respectively as the "rectilinear," the "symmetrical" and the "Steinheil aplanatic," this particular class of instrument being most rapid in action. When a lens of this order is used in its complete form—that is, as sent from the maker—it covers a plate of certain dimensions without any diaphragm; but by using a small stop the covering power is extended and the area of sharp definition increased. If now a series of very weak concave lenses be obtained (those by means of which we have conducted a large number of experiments were spectacle lenses for short sights), and if one of these be inserted midway between the lenses of the photographic combination, the focus, and, consequently, the covering power, will be greatly increased. To give an instance: we possess a lens coming under the category above named, purported by the maker to cover a 6 × 5-inch plate. In total disregard of its maker's suggestion we have invariably used it for plates 7½ × 5; and when employed with a small stop the back lens alone will cover 12 × 10—with, of course, a curvilinear distortion when applied to architecture on a plate of such dimensions. With a view to converting it temporarily into a 12 × 10 *non-distorting* instrument we selected a concave lens of the cheap class already indicated—the strength of this lens being such as nearly to neutralise one of the achromatics of the combination—and inserted it in the position of the diaphragm. The effect was that the focus of the combination was immediately doubled, with absolute freedom from distortion. When taking a picture with it in this altered condition we found it necessary to use a small stop, as the field was now over-corrected for flatness; but what we scarcely expected to find was the fact of the lens working to visual focus—a fact at which one's wonder ceases when it is considered that, as we have already said, photographic correction of colour is a compromise.

From the foregoing, and from several other experiments of which that given is a type, we draw the conclusion that a photographer with only one lens may greatly extend its capabilities at a small cost by having its mount so altered—presuming Waterhouse stops are used—as to render it possible to drop in one of a series of diaphragms made as follows:—Provide three or four of the weakest concave spectacle lenses produced, but of progressive strength, and chip them down to about the dimensions of a shilling. When of this diameter they will be very thin. Next attach each of these little lenses to a brass stop of the ordinary Waterhouse form, adopting such means as will be suggested to anyone possessing a mechanical turn of mind—the best in our estimation consisting in soldering upon the stop a very shallow ring of brass sawn from the end of a tube, the depth being such as to leave it on a level with the edge of the lens. A series of these lenses thus fitted ready for insertion can be carried in a diaphragm pocket-case having divisions to prevent them coming into contact one with the other; and, after the value of each, as respects the additional lengthening of the focus of the combination, has been engraved or scratched on the brass

portion of the stop, a photographer who goes to the country with such an adjunct to his lens will find himself enabled to secure effects which without such assistance would be impossible, while, at the same time, the good qualities of the lens as it issued from the hands of its maker are still preserved intact.

What has been said as regards the lengthening of the focus by means of a *concave* lens applies equally to the shortening of it by the expedient of using one of a convex form.

## A MULTIPLYING MIRROR AND ITS USES.

The production of photographs in considerable numbers and of diminutive size—photographs, in short, of the *genus* postage stamp—has at various intervals received much attention. Some photographers do a considerable amount of business in this kind of work, the portraits produced of such minute dimensions as those hinted at being extensively used for the purpose of adorning note-paper, envelopes, or cards. Indeed, a few enterprising firms have not been slow in discovering the value of such an adjunct to a business card, knowing that a card adorned with a portrait stands a far greater chance of being taken care of than one not so ornamented.

The mode of producing portraits of this class is by having the camera fitted with a battery of small portrait lenses, adopting, in addition, the advantages derived from the repeating back. But there is frequently a difficulty, not to speak of expense, in obtaining this optical battery; hence expedients have been sought by which the more expensive plan might be superseded. A few years ago a description of multiplying reflector was introduced in America, formed, if we recollect aright, of a number of small square mirrors mounted in such a manner as to permit their being centered or adjusted upon any point, and in virtue of which the image of the sitter was many times repeated.

Of the mechanical construction of these mirrors we possess no knowledge; but we are happily in a position to give some account of what we believe to be a novel method of producing these minute pictures, and one as effective as it is novel. This we are enabled to do through the kindness of Mr. J. A. Forrest, who suggests the use of a number of small convex mirrors, placed in a room against a window, facing which the sitter is placed. A camera fitted with a portrait lens of the ordinary kind is now directed towards the frame of mirrors, when in each mirror depicted upon the negative will be seen in miniature the form of the person sitting in front.

There are several points suggested by Mr. Forrest in carrying out this suggestion, one being that small discs of glass could be ground and polished to the requisite degree of curvature and then silvered. He has, however, forwarded to us a mirror ground in such a way as to produce the minute images in a simple manner. A sheet of plate glass, about ten by eight inches, has had eight concave circles, each a little over an inch in diameter, ground in one of the surfaces, these being all arranged round one as a common centre. These spherical hollows, having been ground and polished, are silvered by means of any of the now well-known silvering processes, one of which we described in this Journal a fortnight since. Upon looking into the plain surface of the glass, each *concave* hollow that was cut into the back now becomes a *convex* mirror, in which is seen a diminished view of the sitter placed opposite to it; and by the act of taking one photograph of the silvered plate of glass—the camera in this case being placed at one side of the sitter—a number of images corresponding to the number of concave circles are ground in the back of the mirror.

The idea is excellent, and we learn from Mr. Forrest that it can be carried out commercially at a very small expense. By means of a multiplying mirror of this kind any portrait lens may be employed; for the reduction in size of the image is not in this case caused by the lens, but by the convex mirrors.

## ON THE MANUFACTURE OF SILVER NITRATE FROM RESIDUES.

The manufacture of silver nitrate, though not recommended as remunerative when large quantities are to be dealt with, on account of its extremely low price in comparison to the metal it contains, becomes necessary under certain circumstances, as in the case of amateurs whose residues are so small in bulk as not to be worth sending to the refiner. As a suitable sequel to our recent article upon the recovery of the residues we are now about to describe the most convenient plan to adopt when it becomes desirable for the amateur himself to transform his silver into the form of nitrate, premising that we write chiefly for those whose knowledge of chemical manipulation is not sufficiently extensive to enable them to perform the operation successfully and economically without such advice.

The process throughout is not of a complicated or difficult nature, the only requirements being care and cleanliness. These, it is scarcely necessary to say, are incumbent upon photographers in every operation; but when it is borne in mind that the silver nitrate is obtained in the form of a very concentrated solution, the chemical power of which is further increased by the highly-corrosive action of the free acid, it will be at once evident that in order to avoid serious accidents, or, at least, great waste and damage, the very greatest care must be exercised.

Having obtained the silver in the metallic state as directed in our article at page 518, it only remains to dissolve it in nitric acid and crystallise it; but a few hints to those who are unacquainted with the process will be necessary not only to produce the purest and best product, but in order to economise materials. First, as regards the chemicals and apparatus: these are very few, and consist of pure nitric acid (about 1·45), pure bicarbonate of soda, a glass flask or beaker, a porcelain evaporating dish, a funnel, and filter papers, together with a spirit lamp or Bunsen's burner, with suitable arrangement for supporting the dish or flask. To these may be added, if it be intended to fuse the crystals, a small porcelain crucible, as the Berlin basins usually supplied frequently fail to stand the necessary heat to produce fusion. The silver, if in the form of powder, must be thoroughly dried; if in the granulated or "button" state examine it carefully to see that no particles of flux are adherent to it. To ensure this it is well to subject the granules or buttons to the action of cold dilute sulphuric acid, followed by careful washing. Having weighed in the dry state place it carefully in the flask or beaker, and add about two-thirds of its weight of nitric acid and half its quantity of water. After measuring out the necessary quantity of acid it is a good plan to reserve a small quantity until the end of the operation, or until the portion added at first is found to be nearly saturated. By then adding gradually the remaining acid only just sufficient to dissolve the whole of the silver need be used, and a considerable saving in time and trouble effected, owing to the excess of acid to be subsequently driven off in crystallisation being reduced to a minimum.

Upon the first addition of the diluted acid the action does not at once commence, but if the heat be gently raised to about 150° Fahr. ebullition takes place, and the silver is observed to darken in colour slightly, and to dissolve rapidly, quantities of nitrous acid fumes being given off at the same time; hence it is necessary to conduct the operation under circumstances enabling the noxious vapours to be carried away. The simplest way of effecting this is to place the flask or beaker upon the hob of an ordinary fireplace, in order that the chimney draught may remove the vapour as it is formed, the heat of the fire also serving the purpose of supplying the necessary heat. If no fire be available the heat may be applied by means of a Bunsen's burner or spirit lamp, taking care not to use too high a temperature.

The solution acquires a dirty yellow or greenish tint, owing to its dissolving a portion of the nitrous fumes; the colour, however, disappears when the acid is saturated if the silver be quite pure, but if contaminated with copper it retains a permanent blue colour. The silver having all disappeared and ebullition ceased, the clear liquid is carefully decanted from a slight sediment which generally forms, and allowed to cool. If the quantities of silver, acid, and water as given above have been adhered to the solution, when cool, will crystallise into an almost solid mass, from which the small quantity of mother liquor is closely drained and re-added to the deposit in the flask. The crystals are washed with a very small

quantity of *pure* water, which latter is also returned to the flask and boiled gently for a short time, to drive off the free acid, the greater part of which is now in the flask. We have italicised the word "pure" in order to distinguish it from *distilled*, which is frequently very impure. We prefer to use rain water boiled and filtered, which, when cold, is shaken up with a small quantity of carbonate or oxide of silver and a few drops of a neutral solution of nitrate. It is then exposed for some hours to daylight until it ceases to throw down any deposit, when it is to be filtered and is ready for use.

We have now the choice of two separate methods of eliminating the acid—the first and oldest being the plan of boiling to the point of crystallisation and repeated dilution of the concentrated liquor until it shows a neutral reaction to test paper. The only objections to this plan are that it occupies some time and requires great care in preventing the contamination of the solution with dust and other extraneous matter. Furthermore, there is a liability to the formation of minute traces of *nitrite*, which, though said to be of use in some cases, is objectionable in others. The method we usually adopt is to neutralise the acid by means of carbonate of silver, which possesses the advantage of being quickly performed and obviates the necessity of lengthened evaporation, at the same time entailing but slight extra trouble. In order to effect this a portion of the acid solution (preferably that portion, or as much of it as may be necessary, which remains in the flask) is precipitated by means of excess of bicarbonate of soda, having been previously most carefully *decanted* from any remaining sediment. We prefer to follow the process of decantation in preference to filtration as far as it is possible, as, owing to the concentrated form of the solution, a considerable proportion of silver adheres to the filter, while, from its acidity, liability arises of introducing impurities which may exist in the filter paper.

The precipitated carbonate of silver is washed as rapidly as possible in several changes of cold water purified as we have described above, and gradually stirred into the acid nitrate solution until the latter is saturated, which is known to be the case when the solution, after standing some minutes, proves to be neutral, or, possibly, very slightly alkaline to litmus paper, a small portion of the carbonate remaining undissolved. After the undissolved carbonate has been allowed to subside the supernatant liquor must be drawn off by decantation, or it may be filtered. Any of the carbonate which may remain unused may be reduced to nitrate by the cautious addition of dilute acid, taking care to leave a slight trace undissolved in order to secure neutrality. If the quantity be extremely small it may be added, together with the washings of the different vessels, to the silver-waste jar, to be treated on a future occasion.

The neutral solution of silver may now be evaporated to crystallisation, or, if required for use for printing or negative purposes, may be tested for strength by means of the argentometer or volumetrically, and diluted to the necessary degree with pure water. The argentometer is the easiest to use, and in this case will give a correct estimate of the quantity of silver; but when that instrument is not available the volumetric system may be made to yield sufficiently accurate results for any purposes in the hands of even inexperienced persons. To work this plan prepare a solution of dried chloride of sodium, thirty-five grains in 500 minims of distilled water; the latter to be carefully measured in a minim measure. Each five minims of this solution are equivalent to one grain of silver nitrate. Take ten minims of the strong silver solution, carefully measured out in a clean minim measure, and transfer it to a precipitating glass, rinsing out the measure two or three times with a few drops of pure distilled water, which also add to the solution in the precipitating glass. Then drop in from an ordinary pipette, a few drops at a time, the volumetric solution of salt, agitating the solution each time. When the supernatant liquor shows a tendency to remain milky after the subsidence of the silver chloride add the testing solution, a drop at a time and at longer intervals, stirring thoroughly and allowing the precipitate to subside, watching carefully, meanwhile, in order to note when the salt ceases to precipitate more silver. As the *drops* from the pipette are nearly certain to measure either more or less than *minims* it is necessary to drop from the same pipette into a dry minim measure the same number of drops that were required to precipitate the silver, and the number of minims they represent *divided by five* shows the number of grains of silver nitrate contained in ten minims of the solution—a simple calculation showing the strength per ounce. Ten minims may be considered a very small quantity to work upon; but it must be remembered that the solution is in all probability a saturated one, in which case it will contain considerably more than ten grains of silver. In the case of old baths requiring testing by this method the quantity worked upon should be proportionately larger.

If it be desired to procure the silver nitrate in the form of crystals it is merely necessary to apply a *gentle* heat to the porcelain basin containing it, and to allow it to evaporate slowly until a pellicle commences to form on the surface, when the heat should be reduced. A very good plan is to transfer it to a cool oven and to leave it for a day or two, covering it over with a piece of muslin stretched on a frame, so as to shade it from dust. In this manner large tabular crystals will form, which should be removed from the mother-liquor, and dried by means of warm air on a glass plate. When no further large crystals appear to form add to the mother-liquor a small quantity of distilled water, and raise the heat until ebullition commences, when the apparatus is again removed to the oven and allowed to evaporate slowly.

Those who are not particular about the *appearance* of their product, or who desire to fuse it as recommended by many, will find it much more convenient to evaporate rapidly to dryness, taking great care at the finish of the operation, if it be conducted over an open flame, not to crack the basin, as after the water is driven off the Berlin ware is very liable to crack. A good sand-bath heat, if available, is quite sufficient however, and entails no chance of breakage. The product of this rapid evaporation will be in very small scales or crystals when removed from the capsule in which it forms a compact mass, and should be carefully dried in a warm atmosphere and kept in a carefully-stoppered bottle.

In this state, however, it possesses an unsightly appearance, and it is difficult to retain it in a perfectly dry state, besides which it is liable to discolouration under the influence of light.

The method we prefer is to transfer it, when apparently quite dry, to a small porcelain crucible and to apply heat by means of a Bunsen's burner. The heat should be gentle at first until the last traces of water have disappeared, which can easily be seen, when it must be raised sufficiently to bring about the fusion of the silver. A porcelain slab or other suitable article having been procured, heat it before the fire in order to prevent the too-sudden chilling of the fused mass, and, lifting the crucible by means of proper tongs, pour the liquid nitrate carefully on to the centre of the slab, which should, of course, be in a perfectly level position. The mass having cooled is broken into pieces of a convenient size and preserved in a well-stoppered bottle, forming, if the operations we have described have been carried out properly, the purest form of silver nitrate.

Any small portions clinging to the inside of the crucible must be carefully scraped out and mixed with the rest in the bottle, the crucible being then rinsed out with distilled water. It is important that all the vessels used in the different operations be rinsed with distilled water before putting them aside, in order to prevent, as far as possible, loss of silver. These rinsings may in many cases be returned to the evaporating dish; but where that is not allowable they should be reserved until the next collection of residues. The whole process of reducing silver from residues and re-forming it into nitrate, though to the novice it may appear very formidable on paper, is, in reality, extremely simple; and, though it is not worth the while of the professional photographer in a large way of business to reduce his own residues, it is, as we have said before, the only road open to many amateurs, to whom, in addition to its utility, it will afford interesting employment for a few otherwise unoccupied hours.

## THE PHOTOGRAPHIC EXHIBITION.

[Seventh Notice.]

Among several excellent landscapes by Mr. H. Whitfield a *Woodland Scene* (339) stands out favourably as a good example of his work,

although we prefer, on the whole, his *Summer Afternoon* (331), in which the sultry nature of the day is well shown by the sheep which cluster together in a listless manner under the shadow of the tree.

Of two enlarged landscapes by Mr. Wrenkel the *Undercliff* (276) is undoubtedly the better one.

M. Davanne contributes several pictures by the collodio-albumen process—all of them excellent, but some of them charming specimens of photographic work. In the latter category would we place the *View from Ville Franche Forte*—one of the two pictures in the frame No. 281—it being a fine example of the capabilities of the collodio-albumen process in the hands of an able and enthusiastic artist.

Two fine pictures of lace by Mr. Bates suffer by having been badly hung, one of them (251) being suspended over the door and beyond the reach of careful observation, while the other has been placed so low as to necessitate the spectator stooping in order to examine the picture.

Mr. Brooks exhibits two works, the larger of which, *A Group of Trees* (255), is a photograph of great merit.

Mr. H. Garrett Cocking secured a good model for his *Sam Weller* (398), the free and easy, happy-go-lucky expression of countenance being just what one would expect as an illustration of this wonderful creation of Dickens's genius. Sam is represented as pausing in his avocation of boot-cleaning to make an estimate of the number of lodgers in the house. The youngster in the companion picture, *The (K)night of the Bath* (399), looks as though *he* entertained none of the terrors exercised by the frequently-dreaded bath upon the minds of children. Mr. Collie, of New Zealand, shows several excellent and exceedingly interesting views taken in that distant colony.

It is very difficult to attach a special merit to any one of Mr. Henry Cooper's lovely pictures by comparing it with others of the series, all being so charming and refined. A view in *Dovedale* (374) is, however, an exquisite example of Mr. Cooper's artistic work, and is unequalled by any of his other pictures, unless it be by *A View in Buxton Gardens* (376).

The peculiar beauties of Captain Abney's works have been recognised by all who have had occasion to write or speak of this year's display at the Exhibition. As in the case of Mr. Cooper, so in that of Captain Abney—it is difficult to single out any particular picture for special notice. Still, *The First Cataract of the Nile* (366) and *The Temple of Thothmes, Karnac* (368), may be pointed out as works possessing the highest merits to be expected in a photograph in the present state of our knowledge of the art-science.

Several large portraits of singular excellence are exhibited by Messrs. Cooper and Moorby, the *Portrait of a Gentleman* (191) being a notable example of their work.

Mr. Henry Dixon's contributions contain several pictures possessing great interest, consisting, as they do, of well-executed portraits and groups of officers of the *Alert* and *Discovery*—the subjects imparting interest to the portraits as photographs. Mr. Dixon also exhibits a set of *Lantern Slides of Arctic Expedition*, which would, without doubt, be very serviceable in aiding to illustrate a lecture upon that subject.

A large collection of portraits of children have been contributed by Mr. T. C. Turner, but they have been hung so high as to render examination impossible.

In Mr. Stillman's fine collection of views by the "Liverpool emulsion" the visitor has an opportunity of seeing what can be obtained from this emulsion when worked by a photographer possessing the great experience of Mr. Stillman. Although there are in this collection several charming views in the Isle of Wight, we doubt whether any of them surpass, or even come up to, his *Woodland Scene in America* (324), which is a lovely picture.

In examining several beautiful and attractive little landscapes exhibited by Mr. Stenning the eye rests with great satisfaction upon *Ferns*, one of the pictures in the frame numbered 125, this being a singularly-fine photograph. Mr. Stoddart has been most assiduous in his attentions to Margate skies—or, to speak more properly, Margate clouds—a large collection of pictures of these subjects being exhibited. Mr. Stoddart has also contributed a choice collection of portraits.

In our next number we shall bring to a close these notes on the pictures in the present Exhibition.

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Most chemists and others who have to filter large quantities of various liquids have sought for means of hastening the process, and many are the contrivances which have been introduced for the purpose. To photographers, especially, who have to filter large quantities of collodion, gelatine, albumen, or other viscous solutions, this is a matter of importance, as, even if the quantity of solution be only a pint of either collodion or albumen, it is a work of some hours to filter it satisfactorily. A little apparatus we saw in use the other day struck us as being peculiarly well adapted to this purpose, and, subject to some slight modifications, to many others. It consists, in the first instance, of a strong, wide-mouthed bottle, of any convenient size, fitted with a bung or cork of the best quality. Through this bung is passed a "thistle-head" funnel, the head of which will pass into the bottle, and long enough in the tube to reach to within half-an-inch of the bottom of the bottle, leaving sufficient projecting to bend into the form of a syphon. The funnel must be passed through the cork before bending, and then made air-tight and fixed in its proper position. In addition to this, which forms the exit tube, another shorter tube is to be fixed in the cork so as to project about half-an-inch upon the inner side, and bent at a right angle on the outer side. The latter is connected by means of a strong india-rubber tube to the nozzle of a pair of bellows of peculiar construction which we shall speak of further on. The *modus operandi* is simple in the extreme. The collodion or other solution to be filtered is placed in the bottle, round the mouth of the "thistle" two or more thicknesses of linen are tied, and the funnel dipped into the bottle, the cork being securely fastened down with twine or wire. By forcing air into the filter by means of the bellows the pressure forces the solution up the tube, the linen clearing it of any particles requiring removal; but an ordinary pair of bellows draws a portion of its supply of air through the nozzle, which would in this case interfere with the filtration. The bellows we saw in use were constructed so as to give a regular and continuous blast, and were manufactured for blow-pipe purposes. In addition to the blast being continuous whilst the bellows are working, by means of a "reservoir" it is possible to keep the blast going at a regular pressure for some considerable time after the motion given to the bellows shall have ceased. This "reservoir" consists merely of a disc of thin sheet india-rubber, fixed (air-tight of course) over an opening in the body of the bellows, which again is covered loosely with a strong net. The result is that when the bellows are set in motion, the india-rubber disc bulges out into the shape of a ball, and is only confined by the net; consequently, after the motion of the bellows ceases, the elasticity of the india-rubber keeps up the flow of air until it has resumed its original shape. These bellows may be procured of philosophical instrument-makers at the cost of a few shillings, and are so constructed as to screw down to the table or floor, so as to be capable of use with the hands or feet. We have said sufficient to enable any of our readers interested in this matter to construct, or to have constructed, an apparatus to meet their respective requirements.

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## "SILVER OR CARBON?"

This communication upon that *vexata quæstio*, "silver or carbon," was penned a few weeks ago with the intention of sending it at some future time to the Editors, and, if they deemed it worthy of a place in their columns, to give it to the readers of The British Journal of Photography; but as "An Old Photographer" has already started the matter, I have thought it would, perhaps, be better to let it appear at once while the subject is still fresh in the minds of the readers of The British Journal of Photography.

It will be seen that I agree in the main with "An Old Photographer," but I have gone rather more into detail respecting the various difficulties with which carbon printing is surrounded when attempted for anything beyond the usual fixed groove of purely

mechanical work. The state of affairs has been looked at chiefly from the amateur's point of view, and exclusively as regards landscape work—a phase of the question which, in my opinion, has received but little attention. Even the touching-up processes—of which the name is "legion"—are only mentioned in connection with portraiture, and poor landscape is left out in the cold and not considered worth a thought. Some of the remarks have already been anticipated by "An Old Photographer," but I have preferred to let the article stand as originally written.

Every now and then articles appear in the journals expressive of surprise that carbon printing is not more practised by the amateur and professional photographer (but especially the latter) than it is; and we are favoured with glowing accounts of the beautiful results it gives, the wondrous ease with which those results are obtained, and also of the undoubted permanency of the prints. These and kindred themes form topics for keeping young Carbon "right side up;" but "is there not a cause" why carbon printing is so coldly looked upon in the printing-room of the professional as well as in that of the amateur photographer? *Are* the manipulations all so *couleur de rose* as the enthusiasts of carbon would have us believe? Let us examine the various operations dispassionately.

In the first place, it has come to be pretty generally acknowledged that no landscape claiming to be a "picture" can be fairly considered as such unless accompanied by a natural sky or its equivalent. Of course, we are told at the outset that there is no difficulty in double printing in carbon; well, if this be so, we should like to be made acquainted with the *modus operandi*. After some considerable practice in carbon work I venture to say that very great difficulty will be found in any attempt at double printing in this material; all registration having to be done by guess the getting of uniformly perfect results with *ease and rapidity* will be found a difficulty well-nigh insurmountable. But, supposing everything to have gone right up to the time for developing, when this operation has fairly commenced it will not unfrequently be found that a print fine, perhaps, in every other respect is irretrievably ruined by some stray bit of grit or floating particle having got between the papers in the process of transferring, and, notwithstanding every precaution, this does occur repeatedly—in fact, up to the last moment of development; and even in the alum bath a blister will suddenly make its appearance from no apparent cause, and the work of say half-an-hour is entirely wasted. "These defects can be readily spotted out," say the supporters of carbon; but that is a resource which we cannot undertake to recognise except upon very urgent occasions. We are constantly told by the advocates of the wet process that one of its greatest advantages consists in the artist being able to see what he has got before he leaves the scene of action; and is not this the case in a modified degree with printing?

But our troubles are not yet over. Granted that everything connected with the printing, developing, and re-transferring has been satisfactorily accomplished, the print has to be mounted. Upon applying the mounting solution it not unfrequently happens that the picture which was to have made your reputation has got rather more of the mounting solution upon the face than the back, some defect in the sizing of the paper having allowed the mountant to permeate the print.

I can assure your readers that I have drawn no fancy picture; the above troubles have occurred to me again and again, and everything at the last moment has had to be begun *de novo*. I can hardly think that I have been alone in my experience in this respect; and does it not account, in some measure, for carbon printing making such slow progress with professional photographers—aye, and with amateurs too, to whom certainty of result is no less a matter of primary importance?

With silver printing, it is almost needless for me to say, most of this uncertainty is done away. The printing can be watched from its very commencement; the defective registration can be remedied; the imperfect sheet, if such there be, seen in a moment, and replaced before any time has been fruitlessly expended; while it is a fact which cannot be too frequently brought before those interested in photography that silver prints are *not* necessarily unstable. Where all the operations are honestly performed a silver print is as permanent as a carbon one. This fact has been demonstrated over and over again, and no carbon print that I have yet seen has approached a silver print from the same negative in depth, transparency, juiciness, and delicacy of tone. Prints are now in my possession as pure and as bright in their tones as the day on which they were printed, and yet they were done by me sixteen or seventeen years ago, which surely is a sufficient test of permanency.

What we should like to have is a process which, while giving us the beauty and richness of tone of a silver print, would do so without the disagreeable glare of the albumen surface and the trouble of prolonged washing. The person who first gives us this will be a real benefactor to our art. Messrs. Taylor Brothers' mechanical process seems to come very near the mark, the prints being undistinguishable from those in silver except by a very able expert; but their process is a secret one, and I am afraid hardly adapted to the practice of the amateur, who rarely needs more than half-a-dozen prints from each negative. Perhaps Messrs. Taylor Brothers would not object to enlighten us on this point, and, if suitable, throw it open to amateurs, as the Autotype Company have so generously done with carbon. That carbon printing has a mission to fulfil I am quite willing to admit; but that it lies in the direction of abolishing silver printing I beg leave to deny.

WRECKER.

## ON THE INFLUENCE OF THE PHOTOGRAPHIC EXHIBITION.

I SUPPOSE it will be generally conceded that the Exhibition of 1875 is, on the whole, superior to anything that has gone before. It is true that we miss the names of some whose works would be an honour to any country; neither, perhaps, is there any one picture of such transcendent merit as to almost eclipse its neighbours, or afford matter for conversation wherever photographers "most do congregate." But there can be no doubt that the pictures generally are above the average, and the Society is to be congratulated on the success which has attended its exertions. I have reason to believe that, financially, the Exhibition will also prove a success, and thereby the Photographic Society will be encouraged to continue its efforts, and afford, year by year, an opportunity to all who can make it convenient to visit London of seeing, side by side, the work of our best men and comparing it with their own.

From time to time there arises an outcry against centralisation in connection with many different things, and it must be admitted that, in some cases, the provinces are injuriously affected by the tendency which attracts so much to the metropolis; but centralisation has its advantages, which, in some cases at least, considerably outweigh any evils that may arise from it. In the case of a photographic exhibition London, as a centre, possesses advantages so obvious as to make discussion on this point needless. There it is "like a city set on a hill," inviting the attention of the whole nation, and exerting an influence on the art of the country far beyond what would be possible by any local collection, however large or perfect it might be.

I have said that the Exhibition affords an opportunity to all who can visit London to compare the work of our best men with their own; but if its influence ended there I should think it hardly worth the time and labour expended on it. It is acknowledged, however, that its power for good has a much wider range, and that its influence is felt by many who never have an opportunity of seeing the display.

Competition is said to be the soul of business, and in the same way emulation exerts a wonderful influence on art. A man may go on for years producing pictures of the very highest order of merit, but, so long as these are seen only by local eyes, he may himself, while reaping a fair reward, leave no impress on the general work of the nation. But no sooner do a few of his specimens find their way to the Exhibition than they meet with the appreciation justly deserved, and give an impetus to professional work throughout the land that in some cases almost revolutionises a particular branch of photography. The advent of the Salomon portraits is a case in point, for they really did more for the advancement of that branch of the art in a few months than had been done previously in as many years before public attention had been directed to M. Adam-Salomon's exquisite work in portraiture.

There is one feature in connection with the present Exhibition which I regard with special gratification; I allude to the unusually large amount of favourable notice it has received in the columns of the leading metropolitan newspapers. Such notices reach a class of readers who do not generally see the journals more especially devoted to photographic literature, and will, undoubtedly, have the effect of extending public interest in photography by correspondingly increasing the purchasing tendency, which, after all, is one of the strongest incentives, if not *the* strongest, to the production of high-class pictorial results.

But good as is the present Exhibition, and great as undoubtedly its influence will be, I think there is still some room for improvement. A careful analysis of the catalogue will show that, although the provinces are to a certain extent represented, there must be hundreds of photographers capable of doing the finest work who do not exhibit at all. No doubt this arises, to a large extent, from the habit of regarding the Exhibition in question as something too local to be of interest or advantage to them. That this is a mistake I am quite

certain, and am in a position to point out, if necessary, more than one provincial photographer who could trace a turning point in his career to the influence, both direct and indirect, of the exhibition of his pictures at the annual display of the London Photographic Society.

As one means of increasing the value of future exhibitions, I would urge photographers throughout the country to resolve at an early period of the season to become exhibitors, and to have ever before their minds that the pictures in hand may turn out to be those most worthy of the honour. This could not fail to produce a favourable reaction on the work of the season; and if the country generally was more thoroughly represented it would go far to remove the impression that the Exhibition was purely local in character.

A more general belief in the extended character of the Exhibition—or, rather, a more widely-spread area of exhibitors—would pave the way for the trial of a scheme repeatedly talked of, but which hitherto has been considered impracticable. Photographic exhibitions, during the earlier days of photography, were wont to be held in various provincial towns, but for some years they have, for various reasons, been abandoned. Now it has more than once been suggested that a collection of pictures might with much advantage to all concerned be transferred, say from London to Edinbugh and from thence to Dublin, and thus these art-treasures would be seen by multitudes who otherwise could not have the opportunity. Of the benefits to be derived from such a course I have no doubt, although from a financial point of view the scheme would require some further consideration. The only objection I have heard made to it was that provincial photographers were not likely to care to see only the productions of their London brethren; but if the exhibitors, as I have suggested, were drawn more extensively from all parts of the country this objection would have no weight.

The subject, on the whole, is one which everywhere interests the profession. Nothing should be left undone to give the annual Exhibition the popularity it deserves; and I am sure that if the freemasonry so generally claimed for the lovers of the art get fair play there need be little difficulty in largely increasing its influence for good. John Nicol, Ph.D.

## OBJECTIONS TO CARBON PRINTING ANSWERED.

I read in the number of the Journal for November 5th an article by "An Old Photographer" on *Silver or Carbon?* I am an old carbon printer, having received my first lesson from Mr. J. W. Swan, when he practised carbon printing at Newcastle-on-Tyne many years past. I do not often trouble you, so you will, perhaps, allow me to have my say on a few of the objections which "An Old Photographer" has to carbon printing.

His second objection is in connection with double transfer. It is no trouble at all, being one of the simplest and most reliable I know of in the whole routine of photographic work.

His fourth objection is not merely one, but two, so I shall take the portion relating to exposure first. He says "the exposure is quite double that of silver." How anyone who has ever printed in carbon could make such a statement is quite beyond my comprehension, as printing in carbon requires not quite a fourth of the exposure required in silver printing. I must, therefore, attribute "An Old Photographer's" statement as to exposure to a want of practical experience. In regard to the latter part of his fourth objection: let him prepare for me a tissue as good and at a cheaper rate than that prepared by Messrs. Spencer, Sawyer, Bird & Co., and I will guarantee him against any action which said firm may raise; so do not let him say another word as to "a close monopoly."

As to the fifth objection: allow me to inform him that I have shown prints of cabinet-sized portraits in carbon and silver to very many old and experienced photographers, and never found one of them who could tell with certainty which was carbon and which silver; but all experienced no difficulty in pronouncing which they thought best, invariably giving the palm to the carbon pictures, as possessing better gradation and detail.

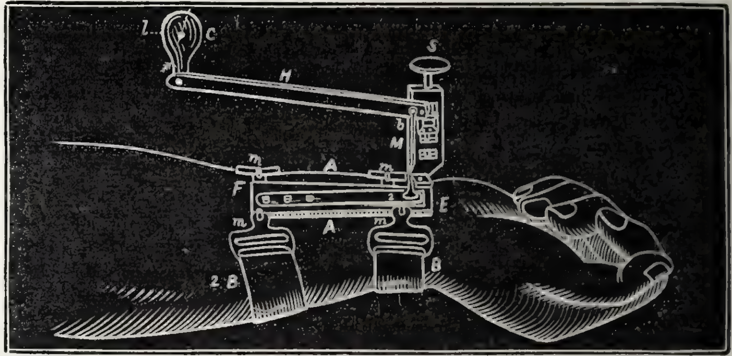
I trust "An Old Photographer" will not think I have spoken too strongly as to his objections to carbon printing. If I have spoken emphatically it is because I feel strongly on the subject. I hope that your correspondent is not too old to live to see silver entirely abandoned for the beautiful, *permanent* process of carbon printing.

An Old Carbon Printer.

## DR. STEIN'S NEW PHOTO-SPHYGMOGRAPH.

Some of our readers may remember that, about six years ago, at a meeting of the Photographic Society of France, Dr. Ozanam exhibited a photo-sphygmograph which made a considerable noise in the world. Its construction was very simple, the largest article required being a camera some eighteen inches long, four and three-quarters high, and one and a-half wide. In the middle of the camera there was a partition with a small vertical slit in it, through which all the light that reached the interior of the camera had to pass. In front of the slit a glass tube one millimetre in diameter was placed, and was connected by an india-rubber tube with a small pyramidal reservoir, the lower end of which was closed by a very thin skin of india-rubber. The reservoir and the tube were filled with mercury, and the former placed directly above the pulse vein. In this way the tube was a sort of barometer, and indicated with great accuracy every movement of the blood. In the inner half of the camera a strip of sensitised photographic paper revolved, upon which the light that passed through the chink fell and drew exactly the curve made by the column of mercury as the blood caused it to rise and fall in the india-rubber tube.

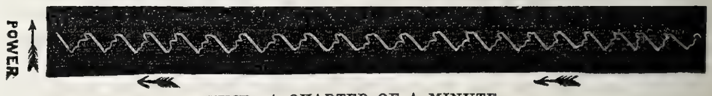
At a recent meeting of the *Physikalischen Verein*, at Frankfort, S. Th. Stein, M.D., showed a more complicated instrument, by means of which the temperature and the rate of the pulse-beat can register themselves by electricity at a considerable distance from the patient.



The accompanying illustration shows the appearance of the new sphygmograph. A A is an oblong metal frame, which is kept in place on the patient's arm by two elastic bands, B B2. A horn knob, 2, is placed exactly upon the radialis artery. An elastic spring, F E, presses the horn knob against the artery, so that the blood-wave in the latter being somewhat repressed gains additional force, and the knob, through its means, affected by every heart-beat, rises and falls regularly and visibly. The pulse-beats are now visible. They have next to be registered photographically. The horn knob, 2, is next connected with the fish-bone lever H by an upright metal rod M, the top of which has a steel edge. Three millimetres from the top of M the lever is fastened with a pin to the bed of the screw S. To the other end of the lever, which is twelve centimetres long, a piece of blackened cardboard C, having a hole $l$ punctured in its centre by a fine needle, is fixed. The screw S spans and regulates the spring. Every time, therefore, that the blood causes the knob 2 to rise or fall it sets the lever in motion, the free end of which describes a wave of about a centimetre; of course the blackened card and the needle-hole rise and fall in unison with it.

If a strip of sensitised paper be drawn along horizontally in a camera placed behind the cardboard so that no light can enter it except through the needle-hole, and if a ray of concentrated light (sunlight or magnesium-light, &c.) be directed upon that hole, supposing the card to be quite still, a straight line will be printed upon the paper; but if the instrument be set in motion by the pulse the wave-line described by the rising and falling of the card will be exactly delineated thus:—

HEALTHY PULSE CURVE FROM PHOTOGRAPH.




TIME—A QUARTER OF A MINUTE.

The height of the curve indicates the strength of the pulse, and the width its duration; the number of beats per minute being ascertained by making a certain length of the sensitised paper revolve in a given time, and then counting the number of waves recorded.

In the same way the breathing and, in fact, every movement of the human body can be photographed, and Dr. Stein showed several experiments in which, by means of magnesium light, ordinary pulse curves were given with remarkable precision.

During sickness—especially in cases of fever—the temperature of the patient is very variable, and it is of the greatest importance that it should be frequently ascertained. This is generally done several

times a day by means of a glass thermometer divided into tenths; but in large hospitals such a procedure occupies a long time, and, as it is not always done by the physician himself, it is not a very trustworthy test.

At the same meeting at which he showed his sphygmograph, Dr. Stein exhibited an apparatus constructed by himself which telegraphs the temperature of the patient to some determined place, and there delineates it photographically. This apparatus is founded on the well-known thermo-electric column. When two different metals are soldered together, if the temperature of the soldered place be different from that of the ends of the metal bar an electric current is created, the strength of which is proportional to the amount of heat acting upon the soldered portions of the metal.

Suppose, then, several metal wires soldered together, one end of which is placed under the patient's armpit, and the other bent into some equal temperature, such as boiling water or melted ice, then an electric current is created proportional to the patient's temperature. If this current be placed in communication with a galvanometer the needle of the latter will indicate the temperature, even if the principal instrument be at a considerable distance from the patient; and if the wire be left for some hours under the armpit the needle will indicate every change of temperature.

If the galvanometer be placed in a dark room, and the magnetic needle connected with a small mirror upon which a single ray of light strikes, the mirror will show the contact of the needle, and the ray of light will vibrate. Let this ray be reflected upon a sensitive plate or paper and it will describe a curve determining the variation of the patient's temperature as communicated by the galvanic current. Instead of a strip of paper a cylinder covered with sensitised paper and divided into twenty-four equal parts may be made to revolve once in twenty-four hours, and in this way the automatic thermometer is photographically self-registering. The same might be done for the sphygmograph, only dividing into five for five minutes instead of twenty-four hours.

## FOREIGN NOTES AND NEWS.

Metallic Appearance of the Face in Certain Portraits.—The Disadvantages of Hardened Glass.—A Test for Pure Benzole.—Dr. Vogel's Camera for Spectroscopic Researches on a Small Scale.—Photography in the Streets and Parks of Paris.—Specimens of Typographic Printing by M. Rodriguez.—Continuation of M. Ducos du Hauron's Process.

In a recent number of the *Photographisches Archiv* Dr. Julius Schnauss calls attention to a peculiar reflex appearance in photographic portraits which he does not recollect having yet seen described in any photographic journal, and which, he is sure, often causes considerable annoyance to photographers. Mere verbal description in such a case fails to convey an adequate idea of what is meant, but where ocular demonstration is impossible one has to make shift with it. The particular phenomenon to which Dr. Schnauss alludes occurs oftenest, he says, with a bath which, when freshly-prepared and with a favourable light, gave negatives rather too intense in the deepest shadows, but otherwise perfect. After this bath has been used for some time without the addition of any fresh nitrate of silver it seems to undergo some unfavourable chemical change—the blacks becoming more intense than ever and the shadows clearer; in a word, the pictures are hard. It is at this period of transition to a bath giving hard pictures that the phenomenon in question shows itself. The sitter's clothes, even when they are dark, come out well; but not so the face, which is of an almost uniformly dark tone, with harsh lights here and there, which are by no means caused by the lighting in the glass house. Judging from these portraits one would think that the skin of the face and hands of the original was very sunburnt, stiff, and glazed with a surface reflecting like metal; yet the same person when taken with a freshly-prepared silver bath generally gives a well-modulated portrait. A very experienced photographer lately told Dr. Schnauss that he was frequently obliged to set aside a very fresh silver bath on account of this appearance, and the negatives he sent fully bore out the statement. The cause was, in his opinion, the distilled water used in the bath. For a considerable time he obtained the distilled water from a chemical laboratory, but since it was obtained from other sources he had got good negatives. Dr. Schnauss is inclined to coincide in this opinion, but invites discussion on the point in the pages of the *Archiv*.

The tide of public enthusiasm for the new toughened glass seems to be on the turn, and experimentalists allow that in some cases the forebodings of those pessimists who prophesied that the introduction of that material would be the reverse of advantageous to the photographer are but too well justified. For lenses—even if the difficulty or almost impossibility of grinding it were overcome—it is unsuitable, because, though translucent, it is not transparent. This is also a serious drawback to its use for negative plates or for glazing windows, only second to the difficulty of cutting it to a given size, which, as mentioned a few weeks ago, can only be done with a diamond in a few exceptional cases. Then the hopes of the photo. glass engraver for a harder and more durable surface to work upon are also dashed to the ground; for, when an attempt was made to etch upon toughened glass with Tilghman's sand-blast, as soon as the skin, so to speak, was broken the plate flew into a thousand minute fragments. Then, again, an evaporating bath of porcelain or glass, though it is useless after being once cracked, generally allows the greater part of its contents to be saved; while a toughened glass bath on receiving the slightest injury is immediately shivered to atoms and every drop of its contents is lost. This subject—hardening of glass and china—has been occupying the attention of a large number of manufacturers of late, and, besides those working M. de la Bastie's patent, several French firms have taken out patents for other methods of attaining the same end. For example: MM. Heinson-Huch have patented a method of toughening glass by heating it to about 400° C., and then placing it in a bath of soot or melted grease; and MM. Boistel et Leger make use of superheated gases or metals.

The *Photographisches Correspondenz* gives the following simple method for distinguishing benzole from the so-called "petroleum ether:"—Place a small quantity of the fluid to be tested in a retort and add a leaf of crystallised iodine. When the iodine is dissolved by gentle stirring if the liquid be benzole it will become a violet-red; if petroleum ether it becomes raspberry-red. In a mixture of the two fluids the colour of the iodised solution will be a compound of violet and raspberry-red, and the latter colour will predominate; yet the violet will be sufficiently visible for the smallest adulteration of the benzole with pretroleum ether to be detected by means of it.

In a recent number of the *Mittheilungen* Dr. Vogel describes a camera which he had specially made for photographing the sun's spectrum several times a day on board ship during his voyage to the Nicobar Islands. The dimensions of the camera were of the smallest—some seven inches long, four high, and five and one-eighth broad—so that it could be conveniently held in the hand or on the lap during the exposure, and everything that interfered with its compactness was intentionally omitted from the design as detrimental to its usefulness. Thus it did not expand, nor did the dark slide push forward, as that would have added to the size by necessitating a projecting back-board. The characteristic feature of the camera is the movable front, made of splits like a miniature venetian blind, which slide up and down in grooves at the sides. The object of this movement is to enable the operator to photograph several spectra on the same plate, which it does in this way:—Along the edge of the upper groove a number of notches, say four, are placed at equal intervals, and after the first exposure the front is pushed up until the split on which the objective or the spectroscope is fixed is opposite the first notch, and after the second exposure, until it is opposite the second notch, and so on. Thus Dr. Vogel obtained his five daily spectra upon a single $4\frac{1}{2} \times 3\frac{1}{4}$ dry plate. These he made at seven and ten a.m., at noon, and at two and five p.m., so that by glancing at a single plate one could observe the extraordinary variation of the strength of the light during the day on which it was taken. The entire apparatus used by Dr. Vogel for his spectral researches on the Red Sea and the Indian Ocean were the camera above described, the spectroscope which was fixed to it, and a small box containing chemicals and dry plates, and he says he cannot speak too highly of its utility and the way in which it withstood the tropical heat to which it was exposed.

There is a law in Paris that no photographer is permitted to impede the traffic by the erection of his apparatus for the purpose of taking views in any public place without special permission, which was very difficult to obtain. This having been felt as a great inconvenience the Committee of the Photographic Society of France were, at a recent meeting, charged with the duty of endeavouring to get the law altered or ameliorated. The last number of the *Bulletin* contains the result of their attempt, which, though not completely successful, at least partially removes the evil. It appears that, in order to photograph any public or other building in the streets of the city, it will be necessary to obtain permission from the Prefect of Police for the district, as being the most able to judge of the requirements of the case. If it be desired to operate in the gardens or parks belonging

o the city or state respectively application must be made in either case to the Engineer-in-Chief, or to the Minister of Public Works. Every possible facility will be given in the granting of permission in order, as far as possible, to suit the weather; but in all cases the photographer will be required to obey any orders given by the police or other agents in charge.

The *Bulletin* also contains three specimens produced from plates prepared by the processes recently described by M. Rodriguez. The first—a portion of the map of Portugal reduced to one-third—is printed at the ordinary typographic press from a zinc plate; the second is a copy of a pen-and-ink drawing, printed in the same style; the third, and most interesting, is a specimen of typographic printing in half-tone, and represents a piece of mineral containing fossil impressions. The half-tones are admirably rendered, the grain being particularly fine.

In the *Moniteur* M. Ducos du Hauron continues his description of his process of heliochromy, giving the details of what he has called the "dry method." The collodion must be simply bromised, and is made from a powdery or "intense" cotton; the bath is to be rendered slightly acid with nitric acid, and the plates, after sensitising, merely washed and dried in the dark. Chlorophyll and aurine cease in this method to produce any accelerating effect upon the action of the coloured rays, but are useful in another way, namely, in colouring the films to prevent blurring. In view of the difficulty of obtaining coloured glasses, not only of the necessary tints, but also free from bubbles and *striæ*, M. du Hauron has sought and discovered a substitute which answers in every way the purpose in view. This consists in coating a colourless glass plate with a film or films of tinted varnish alternated with films of gelatine. If the required tint be not obtained in the one film of varnish any number of the same or other tints may be superimposed in order to deepen or modify it, taking care to interpose a film of gelatine between each two coatings of varnish in order to prevent the action of the last coating from dissolving previous ones. The varnishes employed by M. du Hauron are prepared by MM. Sœhnée *frères*, but no particulars are yet given as to the colours or of what they consist.

## OUR CLUB.

### No. XV.—Tom's Party. The End.

"Moorhouse's story has thrown a damper upon us, rather," Tom remarked, after we had sat in silence for a minute or two.

"After this tale of horror you, Harry Long, start and put us on to a line of more happy thought."

"Yes, Harry, do. Come, tell us how your daughter left you. It's a secret to us yet, and we would like to know."

This desire was expressed by a half gipsy-looking individual with a roguish eye and brown-tanned skin, who was supposed to be deeply in love with the fair heiress to the house of Long. This youth had gone about wearing a habit of sadness ever since this girl had fled from the tents of her fathers to dwell in a house of more substantial construction, viz., wood, various colours all over, real windows made of glass, with real lace curtains tied with real red ribbon, and a beautiful row of front-door steps, which, for convenience, could be swung up and down with a rope. Oh! 'twas a pretty little place!

"You're always thinking and talking of that girl of mine, Ben. It can't come to any good, so drop it."

After giving this bit of advice to his young friend, Harry turned to the company, saying—

"But I don't mind telling you how that child left me, for it will sort of relieve me to have a fair, open talk about it; and as a lot of you don't know the rights of the matter you may as well know to-night as on some future occasion."

"All right, Harry! On you go with your cart!" said a little bandy-legged fellow who sat next Mr. Long, and who was in the habit of giving mesmeric entertainments in the evening as an extra to his daily picture-taking. He was a great believer in the force of will; and, consequently, was always *willing* to make a shilling or two in that way.

"I needn't say," began Harry, "that you all know what a pretty girl our Nancy was, for you all *did* know it, and you all showed it in your faces. Why, bless you! since she was fourteen that girl could have been married twenty times over, and she was only eighteen, lads, when she went away! From her earliest years that child was as dear to me as the apple of my eye."

"And where do you keep that dear thing—'the apple of your eye?'" asked Kellet the Serious, whose cups had begun to make him talkative.

"I don't know that apple is a proper word, Mr. Kellet, but people do say so when they're talking of anything precious. It's very likely it's pupil that's meant, but I'm not *master* of the point, and the degression is *fruitless*."

"'Pupil' would do well enough if you taught her anything, which you didn't," Kellet remarked, as he subsided into silence.

"Look here, lads!" Harry continued, "I love that girl with all a father's love. I let her have her own way in everything. If she didn't want to work I let her play. If she didn't want to get out of bed I let her lie. If she wanted a holiday I gave it to her. If she wanted to stay at home, why I let her. I'll tell you what, lads—I give odds things don't go so easy with her now. I taught her as much as I knew myself, and more, but she always looked beyond me and sneered at our way of life. She was like a queen amongst us, and had such a pride of her own; and, you know, I admired all this at the time and rather encouraged her. I wish I hadn't; we jogged on together right enough, you know, with a little tiff now and then—when she wanted to have her hair curled with the last sixpence we had in the world, or some other extravagance equally childlike and amusing; but it never struck me for a moment that she would leave us. I expected that she would marry and settle. It was not to be.

"From the second day that Jack Bluff, the fat giant, was on the show ground I knew my daughter's heart was gone. He came amongst us in the autumn. My girl went to see him the first day, and I tell you now I saw at once, when she returned to the tent, that her heart was gone. That impression was instantaneous, developed, fixed, and varnished all in a minute, so to speak. No! my lass never did any good after.

"I would sit and watch her creeping from our tent at night—and away she fled over to the back of the giant's home, where he would have his head and half his body stuck out of the back window taking on board as much fresh air as he could between the performances. You see he was obliged to do this on the quiet not to spoil the exhibition; for, had the public known it, there would have been a free exhibition at the back of the van, but they didn't know it and my daughter did. So nightly there the giant and she did the 'Romeo and Juliet' business reversed; for it was the giant that on the balcony played the lover's part. I resolved to put a stop to it; so one night, when she had fairly gone, I slipped out after her, and, crawling under the van, I got quite close to where my child was standing looking up and conversing with her thirty precious stones. I heard him say—

"'We leave here to-morrow and you have not yet arranged. It is cruel.'

"'Now, Jack,' I heard her whisper, 'you just keep up your spirits. When I can give our old man the slip I will, and we'll get married.'

"'When you what?' I cried, starting up in anger. They could hear my voice, but they couldn't see me for the darkness. 'When you give your old man the slip!' And I stamped with rage. As I stood there raging that beast of a giant laughed till his voice shook again. Oh! I *was* wild; but the big youth only laughed the more, and my girl stood without saying a word. 'Look you, Mr. Bluff,' I exclaimed, 'I demand an explanation!' Amidst suppressed laughter he replied—

"'Look you, Mr. Long, the short and the long of it is if you don't get out of this quick I'll fall on you and kill you; that's what I'll do!'

"He had the best of me. The weight was greater than I could bear, so I did not risk it. I called to my girl. She was gone. In grief I returned to my tent. When I returned home I was quite astonished to find Nancy quite repentant and crying. She told me how she regretted her past wilful ways, &c., &c., and she turned so obedient and quiet that she quite threw me off the scent. When we got to the next town one night she disappeared, and none of us ever saw her again. Now she has married that *great* man and takes the money at the door. Gentlemen, the moral of my story is this—Girls, like time and tide, wait for no man, if that man's the father." So ended Harry Long.

The cold grey of the dawn was seeking through the blind ere the stories and jokes were ended, and with "Auld lang-syne" we drained the last cup of kindness.

Tom and I walked out with our friends as far as the "tented field," where they had immediately to begin pulling down their cotton houses and pack them ready to go with the first train in the morning; and as Tom and I were walking back to the hotel, after bidding them all in turn good-bye and success on their various journeys, Tom said—

"A rum lot, Mark! and very jolly fellows! Human nature is human nature all the world over. To-night you have found virtues and vices in their natural state growing in wild luxuriance, untutored and untrained; and do you not think that it is wonderful, Mark, to find here so much generosity, good feeling, and brotherly love existing amongst such a set of from hand-to-mouth poor devils? Doubtless there are many fellows amongst them greedy and thieving; but there are many open-hearted and honest fellows also, and they are not nearly so bad as they look. It seems to me that they are made up of much the same ingredients as some other castes in society who have much more pretensions. I'm rather pleased with my night's work. Good morning, Mark." And Tom walked off to bed, evidently believing that he himself was a great philosopher. Mark Oute.

West Riding of Yorkshire Photographic Society.—The annual meeting will be held on Wednesday next, the 17th inst., at the Victoria Hotel, Bradford. Tea will be on the table at five p.m. A large collection of photographs and apparatus will be on view. After tea a sciopticon exhibition and musical entertainment will take place. Tickets may be had from Mr. Holgate, Bingley.

# Meetings of Societies.

## EDINBURGH PHOTOGRAPHIC SOCIETY.

The sixteenth annual general meeting of this Society was held at the Hall, 5, St. Andrew-square, on the evening of Wednesday, the 3rd inst.,—the President, Dr. Thomson, in the chair.

The minutes of the previous general meeting were read and approved, and Messrs. James Gordon, Hunter, and Lieutenant Gilbert were admitted ordinary members.

The Secretary then read the report of the Council for the past year, which was as follows:—

### ANNUAL REPORT.

The Council has much pleasure in submitting the fifteenth annual report. The year now closed has been one of unbroken prosperity, and the Society continues to occupy its prominent position amongst the scientific and literary institutions of the country.

During the session there have been held eighteen meetings—nine of which were ordinary, three popular, and six outdoor, including the annual excursion. The attendance generally, at all these, has been even greater than during former years; and at the ordinary meetings the following communications were brought before the Society:—

*On the Spirit of the Journals.* By W. T. Bashford.

*On an Unsuspected Cause of Spots on Carte-de-Visite and Cabinet Photographs.* By W. T. Bashford.

*The Photometric Value of the Different Lights Used for Lantern Purposes.* By John M. Turnbull.

*The Progressive Results of the Past Session.* By Dr. John Nicol.

*Extracts from a Letter to a Young Photographer.* By Alex. S. Mackay.

*On the Various Styles of Portraiture.* By John M. Turnbull.

*Art-Criticism.* By W. Neilson.

*On the Use of Permanganate of Potass as an Intensifying Agent.* By W. H. Davies.

*The Aid the Fine Arts have Received from Photographs.* By Dr. Hunter.

*On the Colouration of Statuary.* By R. H. Bow.

*A Substitute for Ground Glass in the Camera; The Use of the Actinometer in Landscape Photography;* and *An Improved Form of Spirit Lamp.* By John M. Turnbull.

There were exhibited at these meetings the following apparatus and pictures:—A collection of photographs by the late Oscar G. Rejlander. By Messrs. Constable and Elliot.—A large collection of photographs of works by the great masters. By Mr. Black.—An improved camera in which dry plates could be changed without slides. By D. Aird.—An improved drying-box. By W. Dallas.—Copies of works by the Italian Masters. By Dr. Hunter.

Four distributions of photographs took place during the session. The photographs were kindly contributed by the following gentlemen:—Dr. Thomson, W. H. Davies, R. G. Muir, G. A. Panton, Colin Sinclair, Alexander Mathieson, Alexander Nicol, Dr. Nicol, and Messrs. Ross and Pringle. The Council has reason to believe that these distributions have tended materially to induce a more general interest in the Society's operations, and, as there is a number of members who promised contributions who have not yet been called upon, it hopes this important feature will be continued.

The popular meetings were, as usual, largely attended; the subjects of exhibition and illustration were:—

*Egypt and the Nile.* By Dr. John Nicol.

*The North and West Highlands.* By W. H. Davies.

*Sketches of English Life and Character.* By Dr. John Nicol.

The outdoor meetings were held at Collinton, Newcastle, St. Monance, Almond Dell (annual excursion), Preston Grange, and Bonally.

The following donations were received during the year, viz.:—A very fine photographic portrait of the late W. D Clark, Esq., from W. H. Davies. Two photographs from Mr. Wane, Isle of Man, through W. T. Bashford.

It will be seen that the Society has shown its usual amount af activity, and accomplished a fair share of practical work.

During the session the membership has not materially changed. Thirty-six members have been added to the roll, seven have resigned, and one has been removed by death. The Society now numbers 309.

From the Treasurer's report it will be seen that the financial position of the Society is encouraging and satisfactory.

The report was adopted, and the Treasurer submitted his balance-sheet, showing that the financial position of the Society was in every respect satisfactory.

The meeting then proceeded to the election of officers for the ensuing year, when Dr. Thomson, President, Mr. E. R. Yerbury, Hon. Secretary, Dr. John Nicol, Corresponding Secretary and Lecturer, and Mr. T. Niven, Auditor, were unanimously re-elected to these various offices. Dr. J. A. Sidey was appointed junior Vice-President, and Messrs. Colin Sinclair, John Lessels, and Alexander Asher were elected Councillors in the room of those retiring by rotation.

Dr. Thomson said he begged to thank the members of the Society for the honour that had been again conferred on him by his re-election to the office of President. What he said last year he could not avoid saying again, namely, that he had grave doubts as to the wisdom of their choice. He, however, assured the members that so far as lay in his power everything should be done to advance the interests of the Society; and with the cordial support and co-operation of the office-bearers and Council he felt assured that the session then begun would be as successful as that which had been just brought to a close. For some months the interest of the Society would lie mainly in its ordinary meetings, and the principal efforts of the Council would be to secure the reading of suitable and interesting papers at those meetings. That, he said, was a matter in which the members generally could materially assist the Council, and he hoped that whenever a member had anything worth bringing before a meeting he would not wait to be asked, but at once communicate with the Secretary on the subject.

Mr. William Neilson then proposed that the thanks of the meeting be given to the office-bearers, under whose management so great a measure of success had been attained. No doubt the best expression of thanks that could be given was their unanimous re-election, but still the usual formal vote must not be omitted. He also moved a hearty vote of thanks to the retiring Councillors. They had the satisfaction of knowing that they had contributed largely to the success of one of the Society's most successful sessions; and, while he sympathised with them in their relegation to the ranks, he had no doubt that as private members they would continue to do all in their power for the interests of the Society.

Both votes were carried by acclamation.

The Corresponding Secretary then read a communication from Mr. D. Winstanley, of Blackpool, enclosing a diagram showing the daily variation in the aggregate chemical power of the daylight of the northern sky in that locality, which elicited some discussion, the outcome of which seemed to be the desirability of some standard unit of actinism which would be understood and generally accepted. Until that was attained little benefit could be expected from such a course of observation.

The thanks of the Society were given to Mr. Winstanley, and the meeting was adjourned.

# Correspondence.

Meeting of the Photographic Society of France.—Two Prizes of 500 Francs Proposed.—Presentation of Prints in Fatty Ink, and Carbon Prints.—Polychromic Proofs.—Voyage of M. Angot.—New Camera Obscura.—Professor Stebbing on Platinum Printing.

The Photographic Society of France, after a long vacation, assembled on Friday last, the 5th inst.,—M. Davanne in the chair.

An important discussion took place upon the very old, debatable subject, dry plates. Many of the members—among whom were MM. Audra and Chardon—had been making experiments with emulsions during the holidays, and they were unanimous in the opinion that a well-prepared bath plate was by far preferable to one made with an emulsion, both as regards sharpness of image and rapidity of exposure. These gentlemen, in conjunction with the Chairman, proposed that the Society should offer a gold medal of the value of 500 francs to any person who should present to the public a new dry collodion process easy to prepare and, above all, sure and certain in its effects, with corresponding rapidity.

Other gentlemen took up the theme, saying that sufficient rapidity had already been obtained, and that it was not to the collodion but to the developing solution we should turn our attention and endeavour by it to get sufficient rapidity.

M. Franck de Villechole proposed that a prize should be offered to anyone who discovered and proposed a means whereby an instantaneous portrait could be taken in a studio.

A discussion here took place—in which MM. Davanne, Franck Liebert, and others took part—as to what lens should be employed. M. Davanne was of opinion that any one of the ordinary portrait lenses was all that was necessary; for (said he) if the use of a special lens were to be admitted no control could be maintained, as rapidity would only be obtained in this way by using such and such a lens, and which instrument would, perhaps, be only obtainable at a large expenditure. Therefore quickness of exposure would not be a quality inherent in the collodion or the developing solution, but due to a superior lens too dear for the means of many photographers.

M. Liebert was of opinion that the prize should be offered for the discovery of a more energetic developing solution, and he should himself be most happy to offer 500 francs as a prize to be awarded by the Society to anyone who could discover a new developing solution which would permit wet plates to be exposed instantaneously in the studio.

M. Liebert was congratulated by his colleagues, and thanked by the Chairman for his generous offer.

After the presentation of new members and the reading of extracts from foreign journals—among which I am pleased to say The British Journal of Photography had a marked preference—the President called on MM. Roze, Chefdeville, and Deroziers to present their collection of proofs in fatty ink.

These prints were very pretty as regards choice of subject, &c., and as fatty-ink productions they were also very good; but they were not

the superior proofs we have been accustomed to see lately, for it must be acknowledged that printing in fatty ink has made great progress towards perfection during the past year. Many intelligent men have occupied, and do occupy, themselves with this branch, and by constant interchange of ideas great emulation has been created, of which science, as well as the public, is naturally the gainer.

M. Alfred Chardon presented some very fine carbon prints. This gentleman, who is one of our most distinguished amateurs, is well-known to be an indefatigable worker; in fact, he has devoted very much of his time to the advancement of carbon printing. Success has crowned his efforts, and he now reaps the reward due to his intelligence and perseverance.

The Autotype Company sent some very remarkable proofs for inspection, but they were passed over without the attention being paid to them they deserved, as no one was present to represent the Company. I think it my duty toward the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY to inform them that should they desire to exhibit any proofs or new invention it would be better to be represented by some one at these meetings; for in making any presentation a verbal description at the same time commands more attention than the customary phrase, such as—"Gentlemen, a few proofs are sent for your inspection," &c., &c. The human voice has a charm and a power which commands attention, and we were surprised that our colleague M. Franck did not, as he was ever wont to do, seize the occasion to be the advocate of carbon printing, as we are all aware that it is due to his position and to his perseverance that this process has obtained a firm foothold in France. Is it that he has changed his opinion and gone over to the camp of those who find carbon printing "too fantastic and capricious" to become indispensable for the future?—"that is the question."

It is true that all the members present were on the *qui vive*, and that their attention was turned to a subject of which all the newspapers had been speaking during the vacation. I allude to the new photochromic process of M. Léon Vidal; for it was well known from the programme that this gentleman had a new collection of polychromic prints to lay before the Society that evening.

M. Vidal opened his portfolio and immediately he was surrounded by connoisseurs. Some very fine reproductions of oil paintings were displayed; but I will not dwell upon their beauties, as I have already described to my readers what can be done by M. Vidal in that department of our art. This time he brought also many specimens to show what service his invention would render to manufacturers and others. A collection of jewels set with precious stones were reproduced for a goldsmith. These were admirable works of art. The gold and silver, together with the precious stones, were represented having their shades and tones perfectly reproduced. The coloration was so truthful and the relief so great that it appeared as if the objects represented were there in a palpable form. The reproduction of a shell having all the colours of the rainbow excited much admiration, for the different layers of the pearly-coloured substance were faithfully represented. A beautiful vase chiselled by Benvenuto Cellini next charmed the eye, together with different coloured enamels, reproductions of old *faïence*, baskets of flowers, &c.

Even the sculptor will find an auxiliary in M. Vidal when it is found necessary to popularise statues and bas-reliefs. Manufacturers and tradesmen, such as goldsmiths and upholsterers—in fact, business men requiring illustrated catalogues—will be but too happy to call in this new invention in order to be able to represent to their customers some of the *chefs-d'oeuvre* which can be purchased at their establishment.

M. Angot then gave a very interesting description of his voyage to Noumea, where he was sent by the Academie des Sciences to take charge of the photographic department and assist the astronomers in their observation of the recent transit of Venus. He repeated during his lecture his report which was read before the Academie des Sciences, and of which I gave the *primeur* to the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY in my communication of October 11th. M. Angot rendered his lecture very interesting by having the views he had photographed during his voyage projected upon a screen by means of the lime light. By so doing we were enabled to follow him, as it were step by step, during the journey in the different countries of which he was speaking.

M. Van Tenac presented to the Society a new *camera obscura* which he had invented in order to facilitate wet-plate work when travelling. So many of these little apparatus have been invented during the last few years they now pass almost unobserved. Amateurs will no longer be annoyed with solutions, packed in their trunks, which are liable to accidents of every description. I could relate many anecdotes on this subject, but space prevents me. M. Van Tenac's camera has indeed a new feature which is very ingenious. The different solutions can be transferred to and from the bottles to their respective dishes (which are fixed under the camera) by means of india-rubber tubes.

I was then called upon by the President to give a description of the new platinum printing process, which I did as follows:—

"I have the honour to lay before you for your appreciation a small number of proofs printed by the new platinum process invented by Mr. W. Willis, jun., of Birmingham.

"This process is very interesting, for several reasons:—1. It gives delicate and harmonious pictures. 2. It is not liable to fade (so says the inventor). 3. The manipulations in the production of the picture can be said to resemble those employed in the production of silver prints; this reason alone will induce many photographers to try it—even those who are the most opposed to innovations. 4. The cost of the proofs is relatively small if we take into consideration the value of the metal employed; Mr. Willis has assured me that the proofs can be obtained at the same cost as those in silver salts. 5. A great saving of time is secured by this process, for an operator can print five proofs by it during the time it takes to expose one (under the same conditions) in silver salts."

I then gave a full description of the chemical action on which this invention is based, together with the manipulations for the production of the proofs. These I will not repeat here, as the readers of this Journal can find full and ample details of the process plainly and graphically given by the Editors in No. 787, vol. xxii.

The proofs were examined with great interest, the tones admired, and a wish expressed that ere long this process might render service to photography. If pushed on with vigour no doubt can exist upon this point; for the questions, Are our prints to continue to be evanescent? or are they to be permanent? occupy very much the attention of Paris photographers, pushed on, as they are, by the displeasure of the public, caused by the loss of valuable portraits through fading, and which, by the death of the person or persons, have become relics that no pecuniary outlay could ever replace. Now the platinum process, if it fulfil all that is promised, will be easier to employ by photographers than any other permanent process at present known. The enamel process, which is the best of all, is too expensive for the million. The fatty-ink process requires an expensive plant. The carbon process is too capricious to gain the goodwill of all.

Under these circumstances it is not to be wondered at if photographers should desire to employ another permanent process offering them so many advantages, the greatest of which is, in their estimation, that it can be worked in their dark-rooms without the introduction of any special plant, not to mention that the manipulations can be learned in a few hours.

I terminated my presentation to the Society by informing them that an operator was about to come to France for the purpose of working this process. It is to be hoped that success will crown the efforts made by Mr. Willis to promote the progress of photographic art.

3, *Place Bréda, Paris,* E. STEBBING, *Prof.*
*November* 9, 1875.

## RAPIDITY IN DRY PLATES.

*To the* EDITORS.

GENTLEMEN,—I am surprised to find the strong tendency on the part of many writers to advocate *slow* dry plates in preference to *quick* ones. I fear that even my friend Canon Beechey is in this line; while you yourselves are, in my eyes, irremediable sinners in this respect! In my experience a rapid plate is *more certain* and *keeps better* than a slow one; and surely it is better to be able to get a landscape in twenty seconds, or even less, with a small diaphragm, and so get the chances of introducing "life," than to use plates requiring many minutes' exposure, if the lens have a diaphragm small enough to get perfect covering all over the plate.

In proof of the perfect keeping qualities of rapid plates may I ask you to publish the following letter from the chief photographer on board the "Challenger," and alluding to the dry plates I prepared for use on board that vessel:—

"*H.M.S.* '*Challenger,*'
"*Yokohama,* 15*th June*, 1875.

"SIR,—It gives me great pleasure to acquaint you that the dry plates supplied to this ship three years ago are working well, being FULLY sensitive, notwithstanding the great trial they have been subjected to—extreme cold and heat. On some plates I found damp spots on the film, which stains the picture, and hence I discard them; but on selecting plates I travelled up 2,500 feet (where the wet process seemed impossible) and obtained *perfect* negatives. I would suggest that more substance be placed between the plates, as I have

found them sticking together, and hence the same spots on each plate. I am using your new developer, which works well.—I remain, yours obediently,

"To Colonel Stuart Wortley." (Signed) "JESSE LAY, Photographer.

I think it a great thing that these plates should have kept so well through extreme heat and cold and the constant damp of shipboard, and I trust it may lead workers to prefer quick plates to slow. The damp spots appear to be from the faces of two plates touching one another.—I am, yours, &c., H. STUART WORTLEY.

*Rosslyn House, Grove End Road, N. W., November* 5, 1875.

[In our own practice we *greatly* prefer quick plates to slow ones. At the same time we are aware that many prefer plates which are rather slow than quick, on account of an alleged greater elasticity in the duration of exposure, and also of better keeping qualities. That some plates are both slow and bad in this latter respect we are well aware; and from the letter of Mr. Lay, given above, we are much gratified at finding the converse of this to be also the case.—EDS.]

## REDUCING SILVER WASTES.

*To the* EDITORS.

GENTLEMEN,—In your issue of October 29th you give methods for reducing silver wastes of different kinds to the metallic state, but make no mention of the following, which I believe is a common process in the laboratory, and certainly commends itself to the amateur:—

The washed chloride is boiled in an evaporating basin with potassium hydrate and lump sugar. In a few minutes the solution will appear muddy, but will quickly clear, through the precipitation of the metallic silver, which will be found at the bottom of the basin in a finely-divided state. It is as well to continue the heat a few minutes longer, to ensure perfect reduction. The deposit is then washed in several changes of water, which should be tested from time to time with solution of nitrate of silver, the washing being completed when no deposit (of Ag Cl?) is formed. The reduced silver is in a finely-divided state, and readily dissolved by the nitric acid.

I think the above preferable to reduction in a crucible. It certainly obviates the annoyance a friend of mine once suffered through using a flux containing potassium nitrate in a splendid new *plumbago* crucible; well, to use his own words, he made "Roman candles!"

The chemistry of the above process you will, should you think fit, be better able to explain than—Yours, &c., "CHESHIRE."

*Northenden, Cheshire, November* 6, 1875.

[In the article referred to we mentioned the "zinc process" for the reduction of chloride of silver to the metallic state because it is the best and simplest we are acquainted with. Reduction in the crucible is decidedly *the* best method where it can be effected; but for those who are not equal to that task we offered a substitute which we consider the most suitable, though we do not recommend the chemical reduction, either by means of zinc or by the method spoken of above, for the reasons we named in the article to which our correspondent refers.—EDS.]

## PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

*To the* EDITORS.

GENTLEMEN,—Kindly allow me to announce, through your valuable columns, that the Council of the Photographic Society of Great Britain has granted the use of the Exhibition on the evening of Thursday, November 18th (open at 7), for the exclusive benefit of the funds of the Photographers' Benevolent Association. Tickets of admission, 6d. each, can be had from me, or at the door of the Exhibition, 5, Pall Mall East, on the evening of Thursday next, the 18th instant.—I am, yours, &c., W. T. WILKINSON,

174, *Fleet-street, E.C., and* 8, *Kirchen-road, Ealing Dean, W., November* 10, 1875.

## THE DISCOVERIES OF MR. M. CAREY LEA.

*To the* EDITORS.

GENTLEMEN,—I am a great admirer of Mr. M. Carey Lea, for the reason that I have profited by his instructions and have practised most of his formulæ with success.

It struck me, on reading Canon Beechey's communication in your Journal of last week, that he hardly gave the credit to Mr. Lea that is due to him. The old collodio-bromide process had one weak point—that of being slow—from the fact that an excess of silver led to fog and bad work; but Mr. Lea stepped in with *his* new discovery—that a chloride in connection with a bromide gave a new power, allowing the use of an excess of silver, thereby giving great sensitiveness. Chloride of copper was the chemical in question which Mr. Lea recommended for that purpose; this was changed for *aqua regia* in place of the chloride.

Colonel Stuart Wortley acknowledged Mr. Lea's labours, but considered that, with a much larger quantity of silver than recommended by Mr. Lea, the process was much improved (see Colonel Wortley's paper read before the Photographic Society of London—I think in June, 1871). Colonel Wortley afterwards condemned *in toto* the use of a mineral acid, stating that uranium plates were much more sensitive than any prepared by Mr. Lea's formula. Months afterwards uranium was found to possess the additional property of preserving the emulsion; this I regard as accidental, and not the result of chemical perception.

I need not wade through the labours of Mr. Lea and his comtemporaries to prove who was first or who second; but I think it only fair that those who have benefited by his researches and labours should not allow his name to be cast aside, even if our most respected and cherished friend had a strong desire to be the father and founder of a new process.—I am, yours, &c., JOHN HOWARTH.

111, *Thornton-road, Bradford, November* 9, 1875.

# Miscellanea.

THE LARGEST REFLECTOR IN THE WORLD.—Our attention has been directed to a statement made by our French correspondent, Professor Stebbing, in his communication in our issue of October 15th, when in describing "the giant reflecting telescope of the Paris Observatory" he characterises it as "the largest in the world." Now, as the mirror of this telescope is 3 feet 11·3 inches in diameter, while that of Lord Rosse is six feet, that of Lassell is four feet, and the two mirrors of the Melbourne telescope are also four feet each, it follows that the French reflector is the *fifth* largest one, instead of being "the largest," that has been constructed.

AN AMERICAN APPEAL TO ENGLISH PHOTOGRAPHERS.—We have received the following appeal from a committee of the photographers of the United States to their brethren in foreign countries to aid in making the photographic display at their centennial exhibition one worthy of our art:—"Fellow Artists: We are striving to secure for exhibition in Photographic Hall, to be erected within the limits of the International Exhibition of 1876, the most worthy representation of our art which was ever exhibited. We want to see a display made of everything photography has ever done or can do, and we call upon you to join us in the effort to the best of your ability. Ample space in a choice light will be provided for you, and every attention given to your interests. Your resident commissioners will supply you with all necessary information as to space, and the arrangements for shipping, &c. Further than that we will be glad to inform you upon application." We trust that this appeal will be responded to in a generous spirit, and that photographers in this country will exhibit largely.

IRON PIPES.—Last winter (says Mr. J. B. Butterfield, in the *Philadelphia Photographer*) I began to be troubled with minute black specks being deposited all over the albumenised surface of my paper while washing my prints before toning, and could not discover at the time the cause. I inquired from a number of photographers in regard to my trouble and all seemed to agree that it was the paper, so I procured a sample of two or three different makes of paper, and still the same trouble. The paper appeared to be clear when printing, but after washing was full of those black specks which, on rolling after being mounted, would have a metallic appearance. I began to get very much discouraged, having been troubled for about two months, experimenting all the time to find the cause of the trouble, and making different silvering solutions, but still with the same result. At last I thought I would silver a piece of paper and not print it, but, after drying, I placed it in a porcelain dish, and, leaving plenty of light in my room, drew some water directly on it from the tap, when, by examining closely, I could see small particles depositing all over the surface, which on examination proved to be iron rust, having been loosened from the inside of a short piece of iron pipe by the frost over night, the moisture in the pipes freezing after the water was turned off. I caught and filtered some of the water, and was satisfied from the deposit on the filter that I had found the cause of my trouble. I have not used water for washing from that tap since, and have had as clear pictures as I ever had, and shall hereafter discard the use of *iron pipes* entirely.

A NICE POINT OF LAW.—Our evening contemporary, the *Standard*, has an amusing article on a knotty point of law relating to photographers, which is occupying the attention of Brooklyn lawyers. It is desired, says our contemporary, to ascertain what is to be regarded as a legal likeness, and how often a photographer is compelled to keep on taking portraits of a sitter who is repeatedly dissatisfied with results. The Brooklyn photographer appeared in court with seventeen separate negatives, each purporting to represent a certain young lady, to whom he had promised a "speaking likeness." "He placed her in his chair," we are told, "inserted the prongs of the 'head rest' in her back hair; requested her to contemplate with rapturous admiration the optical bait which photographers pin upon the wall to catch the eyes of their patients, and then uncorked his camera." Whether the young lady smiled too soon, and thus impressed upon her negative a series of concentric but entirely useless mouths, or whether she suddenly thought of a hated

rival, the journal which records the case is unable to say; but each time that the artist emerged from the dark closet wherein he had "poured out libations of nitrate of silver to the sun-god, he brought with him a picture which was found 'unsatisfactory,' and was compelled to offer to take anew one which should be more like the sitter, and less like a view of the nebula in Orion." Seventeen times he strove to catch a faithful reflex of her features, and seventeen times he failed. Then he gave up in despair, and the question has to be decided as to whether he is to be paid for his time and trouble, or whether he is to go on taking pictures until the fair sitter is satisfied. The question is a difficult one to settle. If a photographer is bound to take likenesses until his "patient" pronounces a favourable verdict, some persons who do not see themselves as others see them will never be satisfied or believe that their faces are truthfully represented in ugly pictures. As the *New York Times* observes, "a malicious photographer might ruin a rival by perpetually sitting for his picture, and perpetually rejecting the negative with sarcastic comments. To take thousands of photographs for one man, and to receive in payment nothing but gibes and insults, would break the spirit and exhaust the pocket of any 'artist.'" And a person with mobile features could "make faces" which no impartial acquaintance would recognise. On the other hand, unless it is decided that photographers must give a fair likeness, there will be an opening for inferior and careless men to do their work anyhow, with bad chemicals and ignorant assistants. We shall note with much interest the result of the trial, and the arguments which decide it.

## EXCHANGE COLUMN.



## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

*** Several Reviews in our next.

One Interested.—The date of Mr. Swan's carbon patent is February 29th, 1864.

Mona.—Your sketch No. 1 will prove a much better form than No. 2 for the studio.

One in Doubt.—The position C is better than B, because in the latter the sitter would be exposed to a south light.

W. H. J.—Do not make the roof any higher than it is at present. See an article by Mr. G. W. Webster in our next number.

Instantaneous.—The lens employed by the late Mr. Breese for obtaining his instantaneous views was a small combination manufactured for stereoscopic portraiture.

O. C. Smith.—1. The patent was renewed, and still has about three years to run.—2. The idea of photographing the exhibition room is an admirable one; but too late, unfortunately, for this year.

W. W. P.—It is gratifying to find that you have attained such success with artificial light. If you furnish us with particulars we shall be happy to try a systematic course of experiments with it.

C. J. B.—Previous to sunning your bath render it alkaline, or at anyrate neutral. A good way to make it alkaline is to add a little diluted ammonia, although the same end will be secured by adding oxide of silver.

Wish to Learn (Kensington).—Purchase a second-hand camera and lens; these will suit your present requirements. The greenhouse will doubtless answer your purpose; but without seeing it we cannot speak with certainty.

Rev. J. A.—If you cannot obtain a focussing-glass in your vicinity make one by sprinkling a little emery flour and water over a plate of glass, grinding it by means of a small piece of glass to which a bottle cork has been affixed by way of handle.

Canon Beechey's Sunshade.—Canon Beechey informs us that in order to increase the efficacy of his split sunshade he has had it made in five instead of three pieces, as previously mentioned. This will certainly confer an increased power.

A. F. G.—The basis upon which the powder enamel process is applied is collodion, upon which is spread a film composed according to one or other of the five formulæ given for the "dusting-on" process at page 171 of our Almanac for the present year.

Viol (Croydon).—It is very difficult for us to give an opinion upon the qualities of your portrait lens from your description. It will be better for you to send it up by the carrier some day when you are not likely to require it. We presume that you do not use a 12 × 10 portrait combination every day.

A. B. C.—To give you "full directions for making and keeping in working order the negative bath, and best developer for the same," together with the other formulæ you seek, would necessitate our writing a complete manual of instruction for the wet collodion process. Such manuals already exist, and may be obtained from any dealer.

True Scot.—The gelatine will be clarified quite enough for your purpose by filtering it through a piece of calico while very warm. If the *highest* degree of purification were required, it would be necessary to use albumen in the following manner:—Intimately mix the white of an egg with the gelatine solution, and then apply as much heat as will suffice to coagulate the albumen.

H. C. Ross.—By the enamelling of prints is meant the covering of them by a layer of gelatine and collodion. The best way to proceed is to give a coating of collodion to a plate of glass; then upon this apply some gelatine in solution, some of which must also be applied to the surface of the print, which is then pressed into close contact with the glass and allowed to remain until the gelatine is quite dry, which takes about a day. The print is then stripped from off the glass, when it will be found that the collodion film is attached to it.

D.—1. There are several methods by which sensitised paper can be preserved for a considerable period. One of these consists in floating the paper upon a bath of citric acid for a few seconds; a second in floating the paper upon a bath of distilled water and fuming the pads of the printing-frame with ammonia previous to printing; a third in keeping the paper pressed into close contact with a sheet of bibulous paper that has been previously immersed in a solution of bicarbonate of soda.—2. We once made a retouching varnish which the pencil "bit" with a considerable degree of force. It was composed of sandarac, castor oil, and alcohol. The best way to produce the desired quality in this kind of varnish is to make up separate solutions, in strong alcohol, of the sandarac and oil, and to a certain quantity of the sandarac solution—say two or four ounces—add at various intervals some of the other solution, varnishing a plate and testing it with a pencil after each addition. The proportions we found best were eighty grains of the oil and an ounce of sandarac to six ounces of alcohol. Thanks in anticipation for the portrait, which had not been received up to the time we despatched this to the printer.

R. J. T. writes:—"Will you kindly inform me, if it be within your experience, whether hyposulphite of soda in crystals is liable to decomposition by keeping for a year? I find a tendency in my prints (toned in a phosphate of soda and gold bath to beautiful tints of black and purple) to turn brown, and even red, in the fixing bath freshly made of the usual strength, viz., four ounces to one pint of water. One sample of hypo. invariably changes the blackest prints to a red colour—so red that they appear not to have been toned at all. The hypo. I am now using did not at first alter the colour of the prints much, if at all. I have kept it about a year or more in a room subject to considerable heat in the summer, and it now shows the same tendency as the other sample to turn the prints brown or red when fixing. I do not see any apparent change in the crystals of hypo. I read Mr. Russell Sedgfield's article in the Journal of the 5th February last, but his experience is not exactly the same; his prints changed in the washing. Can you explain my difficulty? If so, I shall feel obliged."——We publish this communication in order to elicit the experience of others in a similar direction.

Received.—E. Dunmore; G. W. Webster.

London Photographic Society. — The present session of this Society was formally inaugurated by a *soirée*, on Tuesday evening last, the 9th inst., at the hall in which the Society's exhibition is held. There was a large attendance of ladies and gentlemen, no business, however, being transacted.

Photographs of Jewellery.—Mr. J. W. King, of St. John's-square, Clerkenwell, has favoured us with several cards containing photographs of jewellery. It is impossible to over-estimate the great value of such photographs. The practice of commercial travellers carrying about to customers a valuable stock of jewellery is an expensive mode of submitting to their *clientèle* the various styles and designs of lockets, brooches, earrings, crosses, and other ornaments, and the plan also involves great risk on the part of the manufacturers adopting it. But all difficulty is obviated and all risk avoided by the adoption of the expedient placed by Mr. King at the disposal of dealers, who, by these skilfully-arranged and beautifully-executed photographs, may, while dispensing altogether with a nomadic stock, still enable their clients to inspect the designs and minutely examine the artistic details of the originals of these useful photographic designs of costly jewellery.

## METEOROLOGICAL REPORT,

*For the Week ending November* 10, 1875.

Observations taken at 406, Strand, by J. H. Steward, Optician.

These Observations are Taken at 8.30 a.m.

| Nov. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 4 | 29·84 | W | 50 | 52 | 59 | 50 | Dull |
| 5 | 29·90 | SW | 47 | 48 | 58 | 46 | Foggy |
| 6 | 29·04 | W | 54 | 57 | 57 | 47 | Raining |
| 8 | 29·33 | NW | 38 | 40 | 47 | 35 | Misty |
| 9 | 29·50 | W | 35 | 40 | 54 | 35 | Foggy |
| 10 | 28·64 | NW | 50 | 51 | — | 39 | Raining |

CONTENTS

THE BRITISH
# JOURNAL OF PHOTOGRAPHY.

No. 811. Vol. XXII.—NOVEMBER 19, 1875.

## THE CHROMO-WOODBURYTYPE.

The employment of colour applied by mechanical means to pictures printed by the Woodburytype process is a subject which cannot fail to interest all photographers who have to issue works in large quantities. It is well known that photography is now extensively used for book illustration, that being the mercantile form which demands the largest number of prints of any single subject; and we are further aware that many such subjects would be materially aided by the addition of colour, polychromatic photographs being essentially desirable, if not absolutely necessary, in many cases, of which floral representation may be mentioned as one type.

Lying on "our editorial table," and which may be inspected by all who choose to call for that purpose, is the first picture produced bearing the name which forms the heading of this article, and we now propose to placing before our readers a slightly more extended account of it than we were able to give at the Technical Meeting of the South London Photographic Society, when we exhibited the picture in question.

This photograph in colours represents a picturesque cottage in Devonshire, surrounded by trees and shrubs. The colour of the trailing vines and of the other foliage is green, in its various shades; the sky is blue, the clouds being well marked in their natural colours; the walls are stone-coloured; the flower-pots and bricks are red, and soforth. The general appearance of the picture is that of a small painting in oil colours; nor is this appearance lessened by a more minute examination. This is more especially the case in consequence of the basis of the picture being linen, the texture of which is plainly discernible. So much for the appearance of the picture; now for the method of its production.

It is merely a combination of chromolithography with Woodburytype. This combination in itself is not now put forward as a new thing, it having formed the subject of a patent several years since, and which has been long ago described in these pages. But the manner in which the combination is effected attests the ingenuity of Mr. Woodbury, and also his skill in reducing the matter to a state of extreme simplicity.

The first thing is to have printed on linen or other material, by the recognised methods of chromolithography, a few plain tints corresponding in colour and position to what is required to give a natural effect to the photograph. These chromatic bases having been produced, the Woodburytype—which must have been printed upon glass as thin transparencies—are laid by the printer, face downwards, upon the coloured fabric, due care being taken to secure proper registration of the photograph with the coloured patches underneath. After being pressed into contact and left for a short time until the linen gelatinous ink of which the image is composed has become hardened the linen is stripped off the glass, carrying with it the picture, which will now be found in close adhesion to the fabric, leaving the glass clean.

The process here described, but with the omission of some details not required for its comprehension, is that by which was produced a picture that has been admired by many on account of its intrinsic merits, and which has been examined with interest by others on account of the possibilities of the application of art thus so clearly demonstrated.

But not alone to pictures by the Woodburytype process may this chromatic method be applied. Transparencies produced by the collodion process, or—simplest of all—by the carbon process, may be treated in precisely the same way as that described; and, not being fettered in any way, there is no restriction as to its adoption.

At what a small price these charming little chromo-Woodburytypes can be produced may be estimated when we say that the cost of each, including *everything*, is less than twopence. This is on the assumption that such a number of copies be ordered as to repay the cost and trouble involved in placing the colours upon the lithographic stones.

## WATER FOR PHOTOGRAPHIC USE.

Considering the importance of the part played by water in photographic manipulations, and the great diversity in its quality as found in various localities and under varying circumstances, we think the subject has hardly received the attention, from a photographic point of view, which it deserves. It is no doubt true that, from time to time, we have published various articles on the subject, containing cautions as to the use of unsuitable water, and offering suggestions as to the most satisfactory way by which it might be made pure enough for the purposes to which it was to be applied; but, nevertheless, there still exists considerable misapprehension as to both subjects, and much inconvenience is frequently experienced that proper attention to the water supply would have obviated.

Perfectly pure water ($H_2O$) can hardly be said to be found in nature, and it is almost as difficult to render it pure even in the laboratory of the chemist, with all the necessary appliances at his command. It is fortunate, however, that absolute purity is by no means essential, and that by very simple and easily-applied means the ordinary water supply of the country may be made perfectly suitable for all photographic operations.

Natural waters may conveniently be divided into four different kinds—sea, rain, river, and spring water—each containing its own character of impurities in varying proportions, depending on the nature of the material through which it passes on its way to the consumer. A fifth kind, but one which may more appropriately be called an "artificial" water, is that known as "distilled," and which, although it should be the purest of all, has been the cause of more annoyance than all the others put together. Although the apparatus is inexpensive, and the process of distilling water sufficiently pure for photographic purposes extremely simple, photographers generally prefer to send for their supplies to the nearest chemist; and we have good reason for believing that in too many cases they would have been as near their purpose by sending to the nearest pump. The simple fact is that, although when a physician writes a prescription for a mixture he generally ends with "*aqua distillata ad*" so much, he knows very well *aqua fontana* will be the article supplied; and, of course, in ninety-nine cases in a hundred it answers the purpose equally well.

But even in cases where distilled water is actually kept in stock the sixpence per gallon for which it is generally sold would hardly pay for the coal or gas necessary for its production, and so the chemist, very frequently at least, prefers to get it for nothing from

some person who uses a steam-engine. The result is that, from a tolerably large experience of the ways of professional photographers generally, we are in a position to say that not more than ten per cent. of them ever use an ounce of the so-called "distilled" water, but are simply content to make the best they can of the ordinary domestic supply. This, on the whole, is found to answer very well, although there are cases and times when difficulties occur that by using a little precaution might be easily avoided.

Rain water is generally considered purer than any of the other three kinds already mentioned, and we have frequently recommended it in preference to them; but in consequence of a reconsideration of the subject, and especially as the result of some recent experiments we have made, we are disposed to think that both spring and river water are very much better than rain water—certainly better than that which has been collected in large cities, the atmosphere and housetops of which are so fully loaded with organic matter.

An examination of the published results of the analyses of domestic ater throughout the country generally shows that the impurities most likely to interfere with photographic success are of three kinds—solid matter in suspension, soluble organic matter, and various chlorides.

The first, in most localities, varies considerably, but in almost all cases is present in tolerably large quantity; this is well known to those who are in the habit of washing pyroxyline by percolation, as in a very short time a large quantity of a muddy or sandy deposit is formed on the cotton. This solid matter is easily removed by filtration—a precaution which should never be omitted, as we have frequently seen a negative injured by the gritty deposit which sometimes obstinately adheres to the film after development.

For the removal of the other two kinds of impurity three solutions are required—nitrate of silver, permanganate of potash, and neutral chromate of potash. The permanganate is intended to oxidise the organic matter; the silver to decompose the chlorides and get rid of the chlorine; and, as the presence of an excess of the silver salt would be injurious in many of the operations, the chromate is intended to indicate the exact quantity required to be used.

The first step in the process is to ascertain the precise quantities of the purifying agents required for any given quantity of water, and for that purpose a pint may be experimented on. The solutions must, of course, be of a standard strength; two grains to the ounce of the permanganate and ten grains to the ounce of silver will be suitable. The chromate may be any strength, but should be pretty strong. Having these ready, the *modus operandi* is as follows:—Into the pint of water, contained in a clear glass bottle or measure, put drop by drop of the permanganate, shaking well after each addition so long as the pink colour disappears, but taking care to stop when, after the lapse of say ten minutes, a faint pink tint remains. Make a note of the number of drops that have been required, then render the water decidedly yellow by the addition of the chromate, and afterwards adding the silver, drop by drop, carefully agitating after each addition.

The chloride of silver thus formed will have a distinct yellow colour; but as soon as the whole of the chlorine has been taken up the formation of the *red* chromate of silver will take place, and the instant this makes its appearance the addition of silver must be stopped, and the number of drops which have been added noted. If, for example, it be found that five drops of the permanganate and eight of the silver have been used, then, by deducting one drop of each which may be considered to have been in excess, and multiplying by eight, it will be evident that for each gallon of water to be purified thirty-two drops of permanganate and fifty-six of silver will be required. The water, after this treatment, only needs filtration to be fit for any photographic operation, except, perhaps, the final washing of a daguerreotype plate—water for which purpose, as is well known, requiring to be absolutely free from any trace of soluble matter.

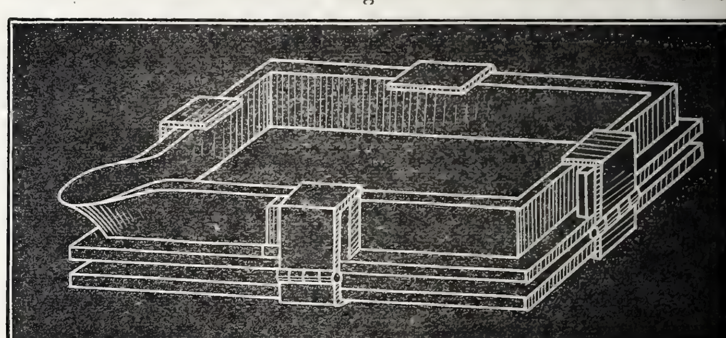
Water, especially in chalk or limestone districts, is generally more or less hard from carbonate and sulphate of lime. In cases where the carbonate is present in such quantity as to be injurious it may be largely got rid of by boiling, the carbonic acid being thereby driven off, and the $Ca\,CO_3$ then easily removed by filtration.

## A NEW DEVELOPING TRAY FOR FLEXIBLE NEGATIVES.

Not the least valuable among the many useful articles exhibited at the Technical Meeting of the South London Photographic Society, held last week, was the developing-frame introduced by Mr. Warnerke for effecting the development of an image on a collodion film spread upon paper.

Very soon after emulsion photography had been practically introduced its adaptability for paper as a support, in lieu of glass, was recognised; but the particular kind of development required proved a fatal barrier to the adoption of paper, owing to the liability of its becoming stained. When in the Isle of Wight, last summer, we saw at the establishment of Messrs. Hughes a frame of a peculiar character and of ingenious construction, which they had had constructed for the purpose of preparing paper by the collodio-chloride process—a process of printing to which Messrs. Hughes had given an immense amount of careful attention. This frame, which was lying among the *disjecta membra* of the large establishment, struck us as being the very thing for using in connection with the preparation of paper with collodio-bromide emulsion, because it provided such excellent means for applying collodion to the surface of paper; and we directed the attention of Mr. Jabez Hughes to the fact that by the introduction of a frame of a similar description to that in question the application of collodio-bromide to paper would be greatly facilitated. The difficulty existing in connection with the development of such films prevented us at the time from giving any details of Mr. Hughes's ingenious frame. This by the way. The developing-frame of Mr. Warnerke bears some resemblance to that of Mr. Hughes, and is quite as efficient an agent in the developing of pictures of the class referred to as the other is in the coating of the paper.

Mr. Warnerke's contrivance consists of a light frame made of ebonite or any other suitable material, and of the dimensions of the square sheet of paper to be developed. Its form will be better understood from the annexed diagram. The frame forms in reality



a tray, having neither top nor bottom. This latter is supplied in the form of a plate of glass the size of the bottom edge of the frame; and this bottom is faced with india-rubber, so that, when clamped to the glass plate by the brass clamps shown in the diagram, it will be in such close contact as to render it quite water-tight.

The manner of using it in the development of a pellicle or paper-faced collodion film is as follows:—The paper or pellicle—which, as we have said, is of the dimensions of the glass plate—is laid down upon this plate, and the frame is then placed squarely down upon it. The clamps are now applied and brought to bear upon the upper edges of the frame, by which the margin of the pellicle is pressed into such intimate contact with the glass bottom as to prevent any liquid which may be poured into this extemporised dish from getting to the extreme edge, and thence to the back.

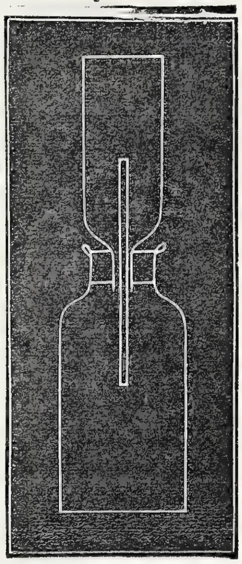
It will be seen that one corner of the frame is bent outwards in the form of a spout, the reason for which is obvious. It will also be noticed that the frame is constructed with a small projection or flange

round its lower edge. This is to afford room for attaching a broader piece of india-rubber than would be possible if an uniform thickness were preserved; for in practice it is found that a small tubular piece of rubber is the most convenient and best form in which to apply the elastic facing.

The introduction of this simple frame will obviate all the difficulties hitherto existing in the way of the successful application to paper of bromide emulsions, whether gelatine or collodion.

## FILTERING COLLODION.

A simple and, as we have proved, efficient filter for collodion was described at the South London Photographic Society's Technical Meeting, by Mr. Murray, of Guildford, and which has since that time been submitted to us for examination.



It consists of two bottles, the larger of which has a rather wide mouth, in which is fitted a cork pierced so as to admit the mouth of the smaller bottle, which is then inserted in the larger as shown in the diagram here given.

A piece of brass tube is previously passed through the neck of the smaller bottle, and retained in position by a loose stuffing of cotton wool which surrounds it at the neck, and which is prevented from falling out by means of a small piece of string.

The collodion to be filtered is poured into the smaller bottle, after which the tube and the cotton are inserted—the former to such a height as to prevent any of the collodion from passing through it. The bottle is now inverted and placed *in situ* over the larger one, when the collodion begins to trickle through.

The object of the glass tube, we need scarcely say, is to provide the means for the air to pass from the lower to the upper bottle as the former becomes filled with collodion.

Mr. Warnerke's interesting paper, read at the Technical Meeting of the South London Photographic Society, shows us how far that gentleman has gone in his attempts to substitute paper for glass in landscape operations. How much this object is to be desired is best known to those who are accustomed to the labour, to say nothing of the risk, entailed in dragging about the country even two or three dozen ordinary dry plates. We have not the slightest doubt as to the practicability of Mr. Warnerke's process —the results he has exhibited are quite sufficient proof of that; and those who desire to combine outdoor photography with personal comfort can scarcely do better than practise his method as soon as possible. The remarks Mr. Warnerke makes upon the subject of the sensitiveness of his tissue at this time of the year are perfectly in accordance with our own ideas; but, with a good gelatine or washed collodion, emulsion containing only bromide of silver should show considerably less disproportion between summer and winter exposures than those mentioned in connection with the tissue. Mr. Warnerke's theory of the action of the india-rubber film upon the sensitive surface is at least probable, and as the treatment he recommends proves a sufficient remedy it need not be considered a matter of great moment. In making the india-rubber solution we always allow the benzine to act for some considerable time, shaking occasionally, and allow any insoluble matter to subside before decanting the clear portion; the latter, though perfectly clear at first, will, after the lapse of some time, deposit a darkish-brown precipitate, which probably has some connection with the "cells" spoken of by Mr. Warnerke. After this last deposit has subsided the liquid may be decanted carefully or filtered, and will then remain clear and good.

## HOW I MADE MY STUDIO.

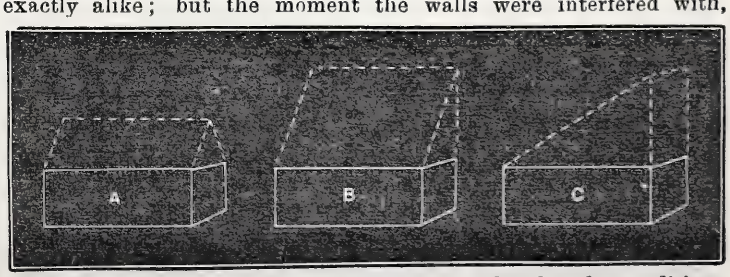
The very interesting and very instructive paper on studios, by Mr. J. W. Gough, in The British Journal of Photography for the 29th ult., deserves most attentive perusal by all who are "about to build," and contains hints applicable to old as well as to new erections. Mr. Gough will, I am sure, however, not object to my pointing out a fallacy he countenances in the latter part of his article, to the effect that the cooling of the glass from the evaporation of water trickling on the roof is the cause of any increased coolness that may be produced. A tolerably-clean sheet of glass that has been exposed to the sun's rays for hours will be scarcely warmed at the end of the time. The cooling arises from the adiathermanous property of water, which only allows a portion of the heat in a ray of sunlight to pass through it.

And now that the subject which has been discussed almost *ad nauseam* is again on the *tapis*, and, owing to recent events, exciting some interest, I am reminded of a promise I made in a former volume, which I now proceed to fulfil, viz., to give an account of the practical conversion of the upper story of an old building into a commodious studio, which has been admired by all who have seen it, and in which, though it was predicted that the exposure would be of the slowest, children are readily taken in a fraction of a second when the light is good. In giving my mode of construction, and the reasons which governed it, it is probable that more hints may be gleaned than from an article entirely devoted to abstract principles.

To start with: there were two rooms at the top of the building running east and west, and, as they were only fourteen feet wide—which would be far too narrow for full-length figures to be taken from side to side—there was no resource but to make the studio run east and west also, with the sitter facing either one or other of these points. The rooms were each twenty feet long; it was, therefore, obvious that they must be made into one. The taking down of the division wall gave me a room forty by fourteen feet, one-half of the length of which I determined to glaze. As the roof had to be removed and the walls altered the shape of the glass part had next to be determined, and the conditions were these:—On the south side was a large window, and on the north none from end to end, and I had, consequently, no rights of light to enable me to throw out a window or side light which would overlook my neighbour. Yet to have nothing but a light from the south under all circumstances was a condition I did not care to be subject to, and I determined to be able to use either a north or south light as occasion suggested.

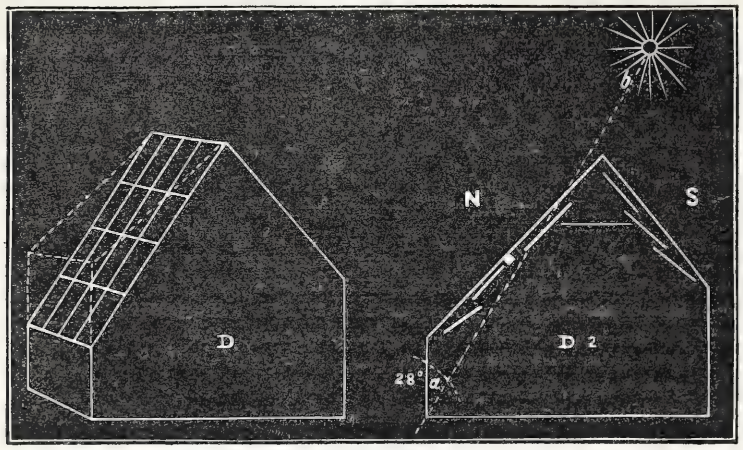
The shape I decided upon was the ridge roof, as the sloping front would have made a very troublesome gutter at the junction with the slating upon the unglazed part, and a "lean-to" of the usual form, would have only lighted one side. In coming to this conclusion I only allowed constructive details to govern me, the lighting not troubling me at all; for, as I have on a previous occasion stated, if one have sufficient light all round, and the sitter illuminated with a wide angle, both vertically and horizontally, the shape of the glazed part has no influence whatever upon the result. I wish here to enunicate the leading principle governing the illumination of the sitter in all studios in a way which I believe to be entirely novel, and as correct as novel. It is that the brick or wooden walls only—that is, *the opaque part* of the studio—govern the amount of light received; and if they remain the same, then, apart from the obstruction caused by the bars or sashes and the very slight loss from obliquely-incident light, it matters not what is put upon them in the shape of glass—whether a perfectly flat roof or the most fantastic, pagoda-like structure imaginable. I cannot lay sufficient stress upon this point, which is yet but another way of stating that it is the angle of light that governs the amount received.

To make my meaning entirely clear I will draw a diagram showing three leading typical shapes of glass roofs represented as being built upon the same brick walls. In each of them, with the practically-inappreciable exceptions named, the exposure required would be exactly alike; but the moment the walls were interfered with,




either by glazing or otherwise lowering their height, the conditions would be altered. The shape adopted by myself was a modification

of the ridge roof A, and the perspective diagram D will give a fair idea of its shape. When the south side is entirely covered with blinds the sun at midday, even in the middle of summer, only just




peeps over the ridge, and its direct light falls for a short time only on to a narrow slip of the studio floor. If it were otherwise the place would be made intolerably hot and other ill effects would also be produced—notably the fogginess that is always engendered when rays of sunlight pass across the space between the sitter and the camera. To ascertain the pitch of roof necessary to ensure the attainment of this end all that is required is to draw a line *a b* from the north side of the floor, making with the vertical lines an angle equal to the latitude, less $23\frac{1}{2}°$, of the place where the studio is built. Thus, for London the angle at *a* would need to be 28°; then all the roof walls to the south of the line will need to be opaque, either permanently or by blinds, to keep the sun out entirely at noon. My south side wall, containing a large window, was about nine feet high, and from it the roof started at a steep pitch to almost the theoretical point just indicated. The north slope, which I looked to for general use, was brought down to within five feet from the floor, the wall being lowered to that extent. I thus got the same effect as if I had built a side light and a shorter slope to the roof, more like the south, or as shown in the dotted line D. Five feet was judged to be as low as would be convenient as regards the sitters' heads coming into contact with the roof. To return to the consideration of the sun—our great enemy as well as our friend—it will be noticed that the pitch of the roof keeps it out at noon; but as it gradually gets towards the west it can look in over the end of the studio. This I obviated by having a sort of louvre-board screen permanently fixed to the west gable and extending to the ridge in height, and from side to side of the building in breadth.

To obtain as little obstruction of light as possible from the rafters on the north side they were set at such an angle that a sitter in the middle of the room at the background end would only see them edgewise. I do not, however, recommend this plan—the gain in light being more than counterbalanced by the weakness of construction produced, which in my own case necessitated the use of a purline to support the great length of bars or rafters, and thus robbed the light in another direction.

The roof was glazed with squares as large as possible, which on the south side were all ground or "obscured;" but in the summer time this is found to be entirely insufficient to reduce the glare and render the light less direct—that is, more like the diffused light from the sky and clouds. Tissue-paper and tracing-cloth were each tried to soften it, and the latter proved the more successful as well as the more convenient and useful. I have recently had sliding frameworks to hold the cloth made so as to enable me to have the softening of the light under more complete control. The north side is clear glass, except the lower set of panes; these are made obscured, as at some little distance away, but immediately opposite, is a dead brick wall rising some few feet above the level of the studio wall. The obscured glass sends to the sitter some of the light it receives in a vertical direction. I am often asked whether I think ground glass lets as much light in as plain. I reply—"If the ground glass be placed between the sitter and the sky a loss of illumination as regards the sitter is produced; but if the glass be between the sitter and a dark object—as for instance, a building—but is itself illuminated from the sky, there will be a gain of light on the sitter." This is a very important point, and one on which much misconception exists. The following may be given as a useful rule:—*If the sky cannot be seen in every direction through the glass by an observer placed in the sitter's position, let the obscured glass be substituted for plain till every external dark object is hidden from view by it.*

Before leaving this phase of the subject I would advert to a practical consideration of great importance where the studio is built upon an isolated building and not immediately surrounded by other roofs. I allude to facilities for repairing and painting the roof at any time. Roofs will leak, windows will get broken, and bars will require painting. My roof soon acquired such a reputation among painters and glaziers that it was with the utmost difficulty I could get workmen upon it; this, too, though I had, in its construction, made special arrangements to lessen the difficulty of working on it. Two rows of angle pieces of iron were secured to the bars for the purpose of supporting any planks that might be required as scaffolding by the workmen; a footboard about fourteen inches wide was put all round, and, in addition, guarded by a narrow rib of wood to keep their boots out of the glass. Ultimately the roof was protected by a light fencing somewhat similar to the iron hurdles one sees in the fields, which was fastened to stanchions bolted into the wall. Now, the roof is perfectly safe for any one to walk upon; indeed, when repairs are in progress, I generally find it useful to get upon it myself and see what is going on.

I do not find the ventilation of the room a matter of such ease as Mr. Gough represents it to be, though I have not tried the plan he suggests, which is simple, ingenious, and likely to be very effectual. I have a window at the east end of the room which can be opened; that in the side in the south wall can be opened, and also a small window at the east end of the glass roof. But my main reliance is placed upon two large unglazed doors in the roof, each about three feet by six—one on the south and one on the north—which can be opened and shut in a moment as desired. I further think very highly of a ventilator which is placed at the highest part of the roof; it is known as "Howard's patent,' and is one of the most efficient I ever saw. The principle is that of the archimedean screw—a large fan-like blade working in a cylinder two feet across, and attached to a species of wind vane, which, whenever the slightest breeze stirs the air, revolves with great rapidity. The fan or blade when revolving literally screws the air out of the room by its own motion, independently of the natural tendency of the heated air to rise and escape through the highest orifice in the apartment.

Little need be said relative to the decoration of the studio. The walls are papered as described in the article by me in these pages a few weeks ago. The floor, except at the sitter's end, is uniformly covered with oilcloth, the pattern being a sort of delicate mingle of two shades of green. I greatly prefer oilcloth or one of its many congeners, such as kamptulicon, &c., to carpet, owing to its being so readily cleaned and freed from dust. A word to the wise here. After washing the oilcloth, as is always done at least once a week, a small quantity of skimmed milk is spread upon it with a cloth. This wonderfully improves its appearance, and helps it to wear better. I may add that silver stains do not readily form upon this surface, and in the rare cases when they do the pattern seems quite to hide them.

The background end is covered entirely with a piece of woollen cloth; I feel bound to say, however, that I much prefer a distemper or flatted oil ground to the cloth, which absorbs dust so freely.

At the end farthest from the sitter—that is, the west end—is hung all the way across the room a curtain quite shutting out from view the window and a little private office I have partitioned off as my own especial *sanctum.*

The heating arrangements have been described in a former article expressly devoted to the subject, and I have only to say of it that I am more pleased with it every year. For the benefit of those who wish to use gas, I may here say that I hope within a month or two to be able to give a description of a perfect gas stove; that is, one which will give the maximum amount of heat under any circumstance possible from the consumption of a given quantity of gas.

I have not yet alluded to the system of blinds I adopt. It gives me very complete control over the light, is most easily worked, and in a few seconds I can entirely change the light from north to south, or again to one corner for the production of the so-called "Rembrandt" effects. It is a constant matter of remark by my sitters how easily the blinds move.

They are simply a series of curtains running, not on rods, but on tightly-stretched wires. Their material is, I believe, called "satteen" by the manufacturers; it is a fine-woven cotton fabric with a smooth surface, close texture, and of considerable substance. I obtained it from the mills, and the manufacturers kindly dyed it for me with indigo, which I preferred for its property of keeping a freshness of colour though exposed to the sun. The particular set I now use have been up almost five years, and are apparently as good as when new. They are nearly, if not quite, opaque to light. They

run from end to end of the glazed part—that is, to and from the sitter—there being in all, excluding the roller blind in the window, seven rows, each row having two blinds; and, when all are extended, the studio is almost dark. Each row has two wires, and the curtains are held by means of brass rings, which are stitched on about every six inches. I was astonished when the bill came in to find there were so many needed; there were five or six hundred rings, and nearly four hundred square feet of the blind material itself. The sectional diagram D 2 shows how the blinds are arranged; the apparently useless one at the extreme top at the south side being for the purpose of keeping out the direct sunlight.

In taking children's portraits all the blinds are drawn back with the exception of the one immediately over head, which is placed so as to prevent the shadows being too black. At other times the light most generally used is from the north, the six blinds on that side being drawn more or less to one side, according to the effect required. The wires are hung by means of small but stout iron hooks screwed into a special framework, shaped to the form of the roof, and are made perfectly tight by means of a small screw, which is fastened to the end of each and provided with a revolving head to attach to the hook. This screw arrangement is difficult to explain without showing it. The wire is attached to a long screw, which works into a female screw firmly welded to one end of two long side pieces, at the other end of which is fixed the revolving head just mentioned. This plan allows of any degree of tightness being given to the wire, and in practice I do not find that when once all are fixed up tight there is any necessity to re-screw them afterwards.

I have now alluded to all the most important details of my studio in accordance with a promise long made. It is done not necessarily as representing it as a pattern studio, but more especially with the idea of showing how obstacles were overcome, and the hope that some of the details might be found useful and worthy of being copied by intending builders. G. Watmough Webster, F.C.S.

## HOT WATER FOR CARBON PRINTING, AND A READY MEANS OF OBTAINING IT.

[A communication to the Technical Meeting of the South London Photographic Society.]

Carbon printing appears now to be entering that interesting period when by the contributions of practical minds its difficulties of detail will be conquered, and the best forms of necessary appliances will gradually be discovered. When Mr. J. W. Swan showed that carbon printing was really practical on a commercial scale, and that prints of great beauty could be obtained in permanent materials, his process was too cumbrous and complicated for the ordinary photographer. Mr. Johnson then simplified the working, and by the further methods of Mr. J. R. Sawyer and M. Lambert the process is at last brought within the reach and capacity of us all. But to the present time no one has furnished the means of supplying a safe, a ready, and an inexpensive means of obtaining a constant supply of the hot water without which the carbon printer cannot work. He will soon find the trouble and uncertainty of depending on the domestic kettle, and the conviction will speedily arise that there must be a coal or gas stove to heat a tank in order to secure a supply. In carbon printing it is advisable, for many reasons, that the development of the prints should proceed simultaneously with the printing; a constant supply of hot water is, therefore, wanted all day long. The water need not be very hot, nor is a great quantity required; but it must always be ready, and there must be the means of regulating the temperature.

It is not at all difficult to arrange a system whereby a self-acting cold-water cistern can be attached to a boiler (having a safety-pipe for the escape of steam), and by gas or a coal fire to heat the water in the boiler, and thus secure a constant supply of hot water. If objection be not raised to the original expense of such an apparatus, and to the cost of fixing and trouble of keeping it going, such a method will certainly secure a constant source of hot water; but I fear that ordinary photographers are not prepared for this addition to their usual plant to qualify them to print in carbon, although something of the sort is certainly necessary.

During some years of experimental work I have tried various means, such as a tank of water with gas jets under, and other methods, but they have failed from insufficiency or too great cost. What is exactly required is a constant supply of moderately-hot water that can be generated at a moment's notice. This supply should be capable of being easily fixed in any place where water and gas are available; it should be secure from the risk of explosion, and should occupy very little room; it must be equally available in summer and winter, ought not to increase the cost of insurance, must have no dust, should be inexpensive in its original cost as well as in its maintenance, and must be no more liable to get out of order than an ordinary mechanic can correct.

All these good and necessary qualities, I am happy to say, are to be found in an ingenious invention known as Maughan's "geyser." This instrument is formed of a galvanised iron cylinder, in the interior of which is a compact series of spiral wires. The heat is communicated by a powerful gas burner. The water in passing into this cylinder is diffused by the wires so that it presents an enormously-extended area to the powerful stream of heated air, and thus becomes *instantly* heated by the simple act of flowing through. It is only necessary, therefore, to turn on the cold water, light the gas, and a stream of hot water immediately flows from the vessel. By this clever invention any sized stream of cold water can by the mere act of flowing through the cylinder be made to rise even to the boiling point, according to the capacity of the "geyser" employed. These instruments are made in various sizes to suit the heating power required. As the carbon printer does not require a very high temperature—about 100° Fah. being sufficient—one of the smallest size and the least expensive will be sufficient for his wants, as such a "geyser" will readily supply a stream of water at a temperature of from 120° to 130° in ordinary weather.

In answer to an inquiry, I am informed by the inventor that the cost of thus heating forty gallons of water is three half-pence, the price of gas being 4s. per 1,000 feet. The proof that the heat is thus economically expended is shown by the fact that, while the water is thus powerfully and quickly heated, the vessel through which it flows is not made hot. In this respect this invention differs from other modes of water-heating, where the water is accumulated in a reservoir and is heated by first heating the vessel itself, and through it communicating the heat to the water. In these "geysers" there is no reservoir, and, therefore, the danger from the accumulation of steam is entirely avoided. To obtain hot water it is only necessary to turn on the water, light the gas, and the stream of heated water immediately flows, to be continued until a sufficient quantity is obtained. Directly this arrives the cold water and the gas are shut off, and the stream of hot water, as well as the cost of producing it, immediately ceases.

Since I have abandoned silver printing and worked exclusively in carbon—now three months—I have had one of these instruments in daily use, and have done all my work with it; I am, therefore, thoroughly qualified to speak of its efficiency. I have induced the inventor to bring one of the small "geysers" here for you to see it in operation, and, in addition to its being put into immediate operation, every person can examine it for himself when the meeting is concluded.

As you will perceive, it is only about eighteen inches high and six inches in diameter, and yet it is capable of doing the work of carbon printing for an ordinary establishment, as well as supplying hot water for other purposes. It complies with all the conditions that I have laid down, and I have pleasure in recommending it.

It has never been used, to my knowledge, for carbon printing before; and, as the result of my experience, the inventor will introduce some improvements, so as to make it more perfect for this branch of photographic practice. Jabez Hughes.

## A SIMPLE METHOD OF PRINTING ORNAMENTAL BORDERS, &c., TO CARBON PICTURES.

[A communication to the Technical Meeting of the South London Photographic Society.]

Within the last few months M. Lambert has brought prominently before the photographic world a process which he has named the "chromotype." This process consists of developing a carbon or autotype print on a washed collodion plate, and, after attaching the transfer paper and drying, stripping it from the glass as described by Mr. J. A. Spencer (of the firm of Spencer, Sawyer, Bird and Co.) in The British Journal of Photography for December 30, 1870. M. Lambert has also introduced a novelty in the process by masking the picture and printing in the name, &c., of the photographer by a second operation.

Now, double printing in silver is a very simple affair, as the image being visible it is easy to adjust the masks in their proper position; but in the case of carbon, where the image is invisible, special means must be taken to secure perfect registration. To secure this M. Lambert has devised a very ingenious pair of printing-frames, or, more correctly speaking, a printing- and a tinting-frame, which answers the purpose admirably; but they are cumbersome, complicated, difficult to fit up, and necessarily expensive. They also necessitate the name or design being lithographed on a thin film of gelatine—another somewhat costly affair.

The plan I am about to describe is exceedingly simple, and requires no special appliances beyond the ordinary pressure-frame and what the photographer can do for himself. In the first place, the writing or design wished for as a border is made on a large—say a "royal"—size sheet of cardboard; then a piece of black paper the shape of the picture is mounted with india-rubber solution upon it in the proper position, and a negative taken of it the size required. The object of using india-rubber solution for the mounting is that by moistening the paper with benzole it may be removed and another shape substituted, so that the same design will do for many different shapes.

Having got a negative, the next thing is to make a transparency of it; and perhaps the best means of doing this is by printing it on a piece of autotype transparency or dense black tissue and developing it on glass. Should the transparency not be dense enough it may be intensified by a solution of permanganate of potash, as described by Mr. J. W. Swan some years ago. Now, having obtained our transparency or, as we shall call it, a "tinter," we shall require a mask for the portrait negative. This may be made by printing the outline of the negative of the design on silvered paper and cutting out the centre with a penknife. By this means the exact size of the opening will be secured.

This mask should be secured to the negative by a few touches of india-rubber solution, which does not injure the varnish and allows of its being removed and used on other negatives. To adjust the tinter, place it on the negative, film upwards, and hold it up to the light, when its position is easily seen. It should be so arranged as to slightly overlap the opening of the mask on two sides, so as to produce the light and dark line or shadow according to taste. When adjusted draw a pencil line on the mask along two of the edges of the tinter—say the top and the left side.

All that is now necessary in printing is to place two edges of the tissue against the pencil lines, and in tinting to see that the same two edges of the tissue coincide with the edges of the tinter. The simplest way to secure this is to push the tinter into an angle of the frame, and then to push the tissue close up to the corner of the frame also. By this means most perfect registration will be secured.

Should it be desired to have a dark design on a light ground—the reverse of that adopted by M. Lambert—it is only necessary to use the original negative of the design, making it, of course, thinner, so that it prints through. In this case the blank cut from the mask should be mounted on this tinter to protect the portrait while the border is printing.

A very pretty effect may also be obtained by making the design on a rough, tinted, cut-out mount, backing the opening with white paper, and using the negative taken from this as a tinter. The mount should be illumined with a strong side light when the negative is taken, so as to show the roughness of the mount, and also to produce a strong shadow of the edges of the opening. E. W. Foxlee.

## SENSITIVE NEGATIVE TISSUE.

[A communication to the Technical Meeting of the South London Photographic Society.]

Sensitive negative tissue has for its object the offering of a substitute for glass in the production of negatives, presenting the advantages of facilitating all operations out of the studio by lightening the weight, diminishing the volume, and facilitating transport. All these advantages, coupled with perfect safety against breakage, abrasion, and atmospheric influences, permit an anticipation of the unlimited keeping of the tissue.

The tissue is prepared on a sheet of paper of very fine texture, through the application of nine consecutive coatings of collodion and india-rubber. The transparent film thus formed can be detached with the greatest ease from the paper, which is used only as a temporary support. The sensitive surface is formed with bromo-iodised collodion or gelatine emulsion.

The sensitive tissue thus prepared on the sheet of paper ($16 \times 10$ inches) is cut into smaller sizes to fit the various photographic apparatus. Twelve sheets of a certain size interleaved with orange tissue paper are formed in a block, protected from both sides with metallic plates, the edges being secured with paper and india-rubber. In this condition the tissue inserted in the block is perfectly protected from the action of light and moisture; it can even be dipped in water with impunity. The thickness of the block of twelve sheets does not exceed the thickness of the ordinary glass plate. It can be carried, without other protection, in the pocket, or sent by post like an ordinary letter.

For exposure the front metallic plate is removed, the orange paper torn away, the first sensitive sheet uncovered, and the block inserted in the dark slide like an ordinary glass plate.

But in the shape of blocks the advantages of the sensitive tissue are not utilised to the full extent. To change the sheets after exposure, the dark tent, or some other arrangement, is necessary; but that implies considerable inconvenience.

The roller dark slide overcomes that difficulty. The sensitive tissue, with supporting paper or without it, is wound on the roller, and changing is effected by turning the brass button. Means to secure the flat surface in a position corresponding with the ground glass, and the exact position of each portion of the sensitive band, are provided.

*Exposure.*—The exposure of the sensitive film is at present equal to the best dry plates existing. The following important observations are applicable, more or less, to all dry collodion processes:—Increase of exposure necessitated by decrease of actinic intensity of light does not follow the same rule for dry collodion films as for wet. If actinic intensity decreasing towards the evening necessitate for wet plates exposures in the ratio of one, two, three seconds, for dry plates it will be necessary to give, perhaps, one, three, six, twelve seconds. It follows that the very same dry plate which may be of equal sensitiveness with wet on a bright day or in June will have quite a different story to tell in November or on a foggy day. Complaints, comparatively general, of want of detail in foliage, with solarisation of brightly-illuminated objects, lend support to my opinion.

Based on this consideration I must in this gloomy November weather recommend a long exposure, and, as a reward, I promise results superior to those of glass plates; because when, by long exposure, sufficient details in the dark part will be secured, brightly-illuminated objects will not suffer, the reflecting surface being absent. The negative I have developed before this audience is a very good illustration of the correctness of my promise. It was taken yesterday during incessant rain, and represents the interior of my drawing-room, which is comparatively dark. An exposure of forty-five minutes overcame the difficulty of the darkness; but there is, in front, a window, with open sky, that requires fewer seconds than were given minutes, and nevertheless no trace of blurring or solarisation is observable. But while I praised the sensitiveness of the tissue in summer, I dare not compare it now to the wet collodion. After exposure in the camera, in the form of block, the exposed sheet is detached, the next is uncovered and similarly treated. The exposed sheet, if preserved from light, can be developed any time after exposure; in fact, I could not observe any difference between the negative developed immediately after exposure and another in which several months elapsed before the development.

*Development.*—This can be executed in two different ways:—

*(a)* The film is separated from the supporting paper. To effect this a pin is inserted between the film and the paper at one of the corners and passed round the edges; then, taken by one of the detached corners, the film is carefully peeled off. A glass plate of the same size as the film, with a little water dropped on it, is now provided, on which the film is laid and slightly pressed with blotting-paper to make it adhere smoothly and flat. A moderate amount of pressure may be used with safety, and there is no danger of injuring the negative in handling it before, during, or after development, provided the hands are perfectly free from grease, chemicals, and perspiration.

*(b)* The sensitive tissue can also be developed while still attached to the paper supporting it. In this case the edges are bent, to form a shallow dish, and the development proceeded with, as will be described; but before the film (after fixing) is detached it must be perfectly dry, otherwise the paper will not leave the film clean.

In order to make the process of development still more easy, and almost possible to execute in the white gloves, I designed a little spring dish formed of a light frame in ebonite, which, when applied to the glass plate and fixed by means of brass clamps, forms a perfectly water-tight dish. It is evident that if a sheet of tissue be laid on the glass plate, and the ebonite frame be put on it, and clamped, it will form the bottom of the dish. All the developing and washing solutions can be applied without the danger of spilling a single drop outside, on the hands, or on the back of the tissue.*

I cannot offer an universal formula for a developer, because every sample of sensitive emulsion requires a different formula for developer adapted especially to it. It is a fact that, with our present imperfect knowledge of the chemical reactions attending the manufacture of the sensitive emulsion, no operator can produce two samples of emulsion exactly alike; but when the strictest observance of certain rules cannot secure uniformity in the quality of the emulsion there is some possibility of readjusting, to a certain

* I imagine that the application of this dish for fixing the photographs on the albumenised paper will add to its stability, preventing sinking of the dangerous compound in the body of the paper by uselessly applying hyposulphite of soda solution to both sides of the paper, from which it cannot be easily eliminated.

point, the difference by using a suitable developer. I adopted, in turn, strong and weak alkaline and the iron and pyrogallic acid developers; but with the sample I developed before this audience the developer differs from the formula adopted by dry-plate workers, and is as follows:—Before proceeding to develope the exposed sheet of tissue a solution, composed of—

| | |
|---|---|
| Alcohol (methylated) | 10 parts, |
| Benzine (pure) | 1 part, |

is poured on, and returned to the bottle for future use. The tissue is next washed with water till all greasiness disappears; then

| | |
|---|---|
| Carbonate of potash | 1 ounce, |
| Water | 10 ounces, |

is applied, and also returned to the bottle. Then a solution of—

| | |
|---|---|
| Sixty-grain pyrogallic acid (in alcohol) | 10 minims, |
| Thirty-grain bromide of potassium | 20 „ |
| Water | 2 drachms, |

is used, and will bring out the image. A few drops more of pyrogallic acid is added, if necessary, to increase intensity, or of bromide, to regulate too rapid development.

*Remarks on the India-Rubber.*—The use of benzine in alcohol is intended to render the collodion film accessible to the aqueous solutions forming the developer. With dry glass plates alcohol alone is sufficient to perform that duty; but in the case of tissue, where the thick india-rubber is underlying the sensitive collodion, very often spots make their appearance during the development.

While investigating the cause of these spots I have arrived at the conclusion that they are occasioned by the india-rubber. Several correspondents to our excellent photographic journals, on more than one occasion, have complained of these spots. Captain Abney, in his last book, likewise observed that india-rubber substratum occasions spots visible in the development.

My theory of the cause of spots is as follows:—I suppose that india-rubber, like albumen or like honeycomb, is formed from cells containing some liquid inside. In the usual process of preparing india-rubber solution the component part of the cells is not separated from the liquid portion. What we call india-rubber solution is, in reality, an emulsion in which some cells are floating unbroken. After the application of collodion to the surface of the india-rubber, the collodion film, while drying, in the process of contracting squeezes the unbroken cells, the liquid rubber comes out, penetrates the collodion film, and makes it in that place a perfect mackintosh, or inaccessible to the action of aqueous developing solutions. It is evident that this will make a round, transparent spot in the negative, and in reality this is the characteristic aspect of the spots.

I verified my theory by actual experiment. On the ordinary dry collodion plate india-rubber was applied, the film transferred, and the developer applied from the glass side; but it resisted the action of the developer where it was penetrated by the india-rubber. Since my theory became an axiom the remedy was self-evident, and is twofold:—1. The use of rubber solution free from cells. 2. The application of benzine before development in order to liberate the collodion film from the grasp of the rubber, thus rendering it accessible to the developing solution.

Further investigation proved that the application of the benzine alcohol solution has a still wider field of beneficial action—it remarkably facilitates the development, and aids in obtaining intensity. I am almost inclined to say that with washed emulsion, in the absence of a body readily absorbing the iodine liberated by the action of light from iodide of silver, benzine performs the duty of an iodine absorber.

Solution free from cells I prepare in the following manner:—A fresh piece of india-rubber, white in colour, is separated in thin sheets and immersed in benzole, where it has to remain undisturbed for two or three days. After this time a considerable portion will be found dissolved in the benzole. The thick liquid is carefully decanted and preserved for use. It is perfectly transparent and colourless. The remaining pieces of rubber are swelled to almost twenty times the original size, and can, with a fresh portion of benzole, aided by heat and agitation, be transformed into excellent emulsion, suitable for mounting or other purposes. I employ it for the formation of the tissue, but I am careful to use for the last substratum only the first decanted portion.

India-rubber has often been condemned for its property of transforming into the brittle powdery state by exposure to the air and light; but who knows whether the disturbing element is not confined to the cell-composing part only? In my comparatively-short experiments I have already observed that the emulsion became brown by keeping, while the first decanted solution is still free from colour.

The fixing is done with solution of—

| | |
|---|---|
| Cyanide of potassium | ½ ounce. |
| Water | 10 ounces. |

Or—

| | |
|---|---|
| Hyposulphite of soda | 1 ounce. |
| Water | 8 ounces. |

In cases where intensification is needful it can be done either before or after fixing. The following, after Colonel Stuart Wortley's formula, is advisable:—

"C.

| | |
|---|---|
| Citric acid | 4 grains. |
| Water | 1 ounce. |

"S.

| | |
|---|---|
| Nitrate of silver | 15 grains. |
| Nitric acid | 5 minims. |
| Water | 1 ounce. |

"P.

| | |
|---|---|
| Pyrogallic acid | 96 grains. |
| Alcohol | 1 ounce. |

"After fixing and well washing cover the plate with sufficient of C and pour off and on two or three times; then add ten minims each of S and P to each drachm of C, which will quickly intensify the plate. All traces of the pyrogallic acid must be carefully washed from the film (both sides). Acetic acid diluted with water is recommended for this purpose.

"When the negative is finished it can be dried on the glass that has been used as the temporary support during development, or inserted between sheets of blotting-paper and dried under pressure.

"For printing, the film is attached to a glass plate by means of friction from a squeegee; but, if this do not give sufficient adhesion, a few drops of water between the glass and the film will be all that is necessary."

The varnishing can be performed with chloroform, amber, or dammar-benzine varnish; but this is not absolutely necessary. If varnish be applied on the paper side of the film it will render it transparent; while otherwise, from the impression of the paper texture, it is like the finest ground glass, which is not objectionable, but rather the reverse. L. Warnerke.

## ON THINGS IN GENERAL.

One of the wisest and most beneficent provisions of nature is the love implanted in a mother's breast for the least-favoured of her offspring. Let a child be ever so deformed and ill-favoured, a parent's love is lavished upon it more freely than on any of its brethren; and the same feelings of fondness are bestowed by authors upon their mental progeny similarly wanting in grace, such as the most powerful minds at times beget. The most crabbed sentences of the orator or the most cacophonous lines of the poet are looked upon as their finest utterances or conceptions.

This is fully exemplified in the case of the *protégé* of a gentleman whom I mention with the utmost respect, Dr. Nicol, whose contributions to the pages of The British Journal of Photography I always read with pleasure and often with profit. After two months to think of it, ingrate that he is—being complimented by me on his strong good sense—he turns round in defence of his poor little bantling, and will have it that it is the prettiest in the world. But, if he refer to his *Notes* that I filliped with weapon reversed, he will see that he simply tells us of a picture which was all painted in oil but the figures, and they were done in water colour. Not a word here about "glazing the figures with oil." No, Dr. Nicol! such a picture as you describe would be worthy of all the dispraise I had to suggest. I have been used to handling a pencil for over a quarter, though under a half, of a century, and I do think I know something of the *technique* of painting.

However, though the paternity of the idea was not due to Dr. Nicol, he adopted it, and the object of the paper was served—the latest novelty out was described, and The British Journal of Photography was to the fore, as it usually is with all new things, good or bad. Why should the rage for novelty burn always so fiercely? Why do photographers, of all men in the world, go seeking for a new thing? Why do they not strive to their utmost to perfect existing processes, and spend their time in producing meritorious, rather than novel, work? My readers may remember Destouche's sarcastic epitaph-couplet upon our insular peculiarities:—

"Ci git John Rosbif ecuyer,
Qui se pendit pour se desennuyer,"

so cleverly done into English by Leigh Hunt, as—

"Here lies Sir John Plumpudding, of the Grange,
Who hung himself one morning for a change."

But with photographers the incessant craving for novelty is cosmopolitan, and I venture to suggest—

Here lies a photographic artist true,
Who hung himself for want of something new,

as being as universally true of the members of the black art as the original is of us islanders.

I need only refer to the latest thing out from the other side of the world—the "promenade" portrait—hailing, I believe, from San Francisco. A careful examination of the merits of the new size—for in its dimensions lies its only claim to novelty—has led to the publication of the fact that it is particularly well suited for short and slender people. I suppose if a sitter of ordinary dimensions or one of unusual size—say a "B. of B. K."—presented himself, with a demand to be immortalised in this particular size, he would have to submit to some Procrustean operation before he could be taken aright.

There is one novelty of late in these pages which I hail with pleasure, and that is the advent again of the well-remembered name of "Hardwich"—a "household word" amongst those for whom books are not written in vain. Long may it continue to appear! With him and Mr. M. Carey Lea the Editors secure the foremost practical men of science of the time. It is a remarkable thing that so little recognition has been publicly made of Mr. Hardwich's work in the direction especially of pyroxyline; but I presume he is in bad odour with manufacturers, as the surest way of making people hate you is to do them a service; they never forgive you!

Not the least among the novelties is the publication of a book of photographs of a portion of the Royal Academy pictures of the year. It is to be hoped that the venture may succeed and be regularly continued, though it is so late in the day to copy the plan adopted with regard to the Paris *Salon*, where it is, I believe, quite successful. The French, however, are not always first; for I see that an old American idea (everyone will remember the great American Bigelow system of lighting and its twenty-five shilling book of portraits to instruct) has been utilised in Alger, whence one M. Klary is issuing a work of instruction in the application of a system of illumination to photographic portraits by means of an apparatus for regulating the light. When will photographers learn that art is not to be induced by machinery? All the processes and patents in the world are worthless if not backed by skill and practice. Everyone should lay to heart and constantly bear in mind Opie's celebrated answer to an anxious inquirer who asked him—"Pray, Mr. Opie, what do you mix your colours with to make them look so bright?" "With brains, sir," was the reply.

I expect it is the same commodity that is used in Mr. Fry's bath, which keeps it from getting discoloured when he uses it for albumen. I must say my experience is very different with regard to its properties; for the strongest of my baths, when acid, take upon themselves to imitate port wine with considerable success when a very little albumen is allowed to make their acquaintance. Albumen, when coagulated, generally leaves a small soluble residuum, so that, though Mr. Fry may have arrived at a right conclusion, it was from wrong premises; but I have not yet heard that his experience has been shared by anyone else.

But doctors proverbially differ; hence I suppose the very varying accounts given of the behaviour of carbon. In the pages of The British Journal of Photography for November 5th "An Old Photographer" sends up a very powerful wail of distress, stating many difficulties experienced and good results not yet attained; yet in the succeeding number "An Old Carbon Printer" tells us that this is all moonshine; that nothing is easier; in fact, it is evident that respect for the Editors only restrains him from calling the first an "old fogie." But then "Wrecker" comes on the scene, and he agrees with "An Old Photographer" in the main.

Now it must be remembered that we are not all "old carbon printers," and, speaking for many beginners and experimentalists, I am very much inclined to say that the carbon is a very difficult process, and the results so far shown are not equal to silver prints.

There has been a very great deal of talk about the most interesting of all carbon processes—M. Leon Vidal's photochromic process—but I have met with very few people who have seen a single print by it. Why do not the proprietors of the vast establishment which we learn is devoted to it take pity upon the photographic world and issue a few examples of their revolutionary process?—for revolution it will inaugurate if it be capable of doing what its sponsors are promising for it. Possibly we shall see specimens in the latest outcome of American vastness—the new Photographic International Exhibition Building. Shades of Archer and Fox Talbot! what would you say if you were recalled to life and photography, and learnt that four thousand pounds were to be spent upon a building alone to show the products of the processes that owe you so much!

Speaking of buildings leads me to the subject of Mr. J. W. Gough's article on building studios—one of the most practical yet written; but one part of his estimate seems rather more *couleur de rose* than the practical working would authorise. If wood at £13 10s. a standard is to cost three-halfpence per foot, I should very much like to know how far removed from that it would be when the cost is taken into account of carriage, porterage, cutting up into battens, and planing it say on one side only, even if the photographer could be supplied on dealers' terms, which he has no right to expect. I think he would find his one-inch battens would cost very much more than three-halfpence a square foot.

These pretty problems have a great interest for the mathematical mind; but for one of a judicial cast a still prettier problem has recently been set. Two photographers dissolved partnership; one carried on the business, and, apparently without that feeling of fraternal love known to be so common among photographers, felt himself bound to open all letters sent for his late partner at the old address. The feeling of honour which might be supposed to an ordinary mind to have dictated a contrary course was, however, evidently overruled by an inward consciousness of a more powerful kind—neither more nor less than second-sight; for I learn from a contemporary, whose ethical notions, it is true, do sometimes run a little counter to those usually held, that, "under such circumstances the latter gentleman naturally—as many will think—opened the letters from old customers sent to the business premises." It is, to say the least, interesting to find a constituted mental organism which enabled its owner to discover the contents of an unopened letter, and also so justified him in opening it though addressed to another person. One only wonders why, with such remarkable gifts, he took the trouble at all!

Before concluding my letter I am going to give the Editors a gentle prick. The best known of them has the deserved reputation of being one of the best-informed men in the optical phase of photography we have among us. Why, then, does he not take more care of his reputation and say he is only broadly speaking when he speaks of the focus of one of the lenses of a symmetrical combination separated by an appreciable distance being half "that of the complete combination." He knows better, or else my optics are deficient.*

Free Lance.

## NOTE ON A SIMPLE MANNER OF SAVING RESIDUES.

[A communication to the Technical Meeting of the South London Photographic Society.]

The following is a very easy mode of securing the entire value of silver contained in residues, or products of development or fixation, and is equally applicable to chloride or hypo. solutions:—

For saving silver from development take a red earthenware seed pan, as used by gardeners for forcing seeds and cuttings, and make a lining to fit the inside of a piece of old drugget or flannel. Fill the inside three-parts full with sawdust, and let it stand in the developing sink. Pour the waste solution in; the fluid gradually filters out, leaving the silver entangled amongst the sawdust. The sawdust does not require to be emptied more than once a year, when the whole can be dried and burnt together. This is much more convenient than any other way I have met with.

For chloride from washings make a bag of the same material to fit the inside of the residuary pan or tub, place a suitable quantity of sawdust in it, and provide a hole with a wooden plug or tap at the side. Fill up your pan at night with chloride washings, and add one drachm for every two gallons of spirits of salt. Each morning turn the tap, or loosen the plug slightly, and let the fluid run off. By evening, daily, it is all gone, and the effluent water should contain no silver.

For hypo. take an old egg case or other large box, fill it with sawdust and place it out of doors under cover—if possible in the sunshine. Let the hypo., after being used for fixing, be poured into this by a boy, and be stirred up to absorb it. An astonishing quantity will be taken up, and, by having two boxes and occasionally stirring, it will dry up and may be used indefinitely. To obtain the silver burn the sawdust and send to the refiner's.

These simple but thoroughly effective methods are, of course, not chemical but mechanical, depending merely on the portions of silver becoming entangled amongst the particles of sawdust and

* "Free Lance" is right in assuming that we were on this occasion speaking "broadly;" writing, as we were, for practical photographers, mathematical niceties would scarcely have been in place, as they would only have caused confusion. That we are not insensible to the full effect produced by the separation of the lenses a special article devoted some time ago to this subject will attest.

being precipitated before they can escape from the vessel—except in the last case, where the whole of the hypo. is retained and the water evaporated. This cuts the Gordian knot of a well-known difficulty. SAMUEL FRY.

## Our Editorial Table.

PHOTOGRAPHS. By B. WYLES & Co., Southport.

AMONG several photographs we have received from Mr. Wyles is one which demands closer introspection than lay in our power at the Photographic Exhibition; the photograph is *The Nest*, being No. 1 in the catalogue, and the opportunity now afforded has enabled us to examine the picture critically under more favourable circumstances. The explanation is simple: for some mysterious cause known best to the hanger of the pictures a few photographs, which from their detail and other qualities *should* have been placed on the line, were—apparently from consideration of their frames or adaptability of balancing something else—placed far beyond the scope of average sight. Among these was *The Nest*, the *subject* of which possibly led to its being placed beyond the range of vision or the reach of hands unaided by a ladder. We need not here dwell upon the mistake of hanging so many portrait enlargements on the line at the expense of pictures in which detail abound. *The Nest*, upon close examination, shows a mass of exquisite leafy detail, grouped together with much taste and photographed with great skill—one of those compositions which bear analytical examination. The whole of the lights are kept in subordination to the leading idea of the picture—the "bird's nest."

Among the pictures is a very fine *carte* portrait of Mr. Wyles himself —a reduced *facsimile*, in some sense, of the large portrait in the Exhibition. This smaller portrait differs, however, from the larger one owing to the absence of the broad lace collar to which allusion was made in this Journal. The picture is in every respect exceedingly successful, being charming as a work of art and excellent as a portrait.

If there be one region more than another for which artists must possess a feeling of *savoir bon gré* it is North Wales. What with mountains, ravines, lovely valleys, quaint cottages, torrents, cascades, and all those natural beauties which constitute the sublime and beautiful, where is there a place combining an equal number of attractions to the lover of the picturesque, or which has been more consecrated to the purposes of pictorial art, than the ancient Principality? The "lions" of that district have been photographed over and over again; but the pictures before us testify to the fact that Mr. Wyles has not confined himself to the beaten track of the ordinary tourist, but has visited many comparatively unknown nooks and secured many very beautiful and attractive artistic reminiscences of the less-familiar but highly-graphic spots in the land of the Cymri. Among these *A Welsh Farm* is a singularly-fine picture, attractive as a composition and brilliant, yet full of detail, as a photograph. Of the same character is a view in the well-known Lledr Valley, Dolwyddellyn, and *A Wood at Dolwyddellyn*.

Mr. Wyles's prints are of a warm brown tone. The size adopted for the Welsh views is 12 × 10 inches, that of *The Nest* being 16 × 20 inches.

## Meetings of Societies.

### SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE annual Technical Meeting of this Society was held at the House of the Society of Arts, on the evening of Thursday, the 11th instant, the chair being occupied by the President, the Rev. F. F. Statham, M.A., F.G.S. The meeting was very numerously attended, indeed was presumed to have been the largest ever held in London in connection with photography. There was a profusion of objects exhibited and explained, of which in this report we can only give a feeble outline. Fuller accounts of some of them appear in other columns in the present number; but with respect to others we shall have to trench upon our issue of next week. Routine business, including the nomination of officers and council, having been transacted, the Exhibition commenced.

Mr. JABEZ HUGHES—who had been requested to officiate as "technical" chairman owing to the non-acquaintance of the President with matters so closely allied to manufactures and processes as those intended to be brought before the meeting—directed attention briefly to the nature and design of these exhibitions, in which, unlike any others existing, the subject of "shop" was not, he said, sought to be ignored, every manufacturer or introducer of processes or appliances, whether open or secret, being made welcome to exhibit and explain, as far as was desirable, the leading features or action of his productions.

One of Cleary's patent reciprocatory burnishers was exhibited by Mr. Hawkins; and, at the request of Mr. Hughes, Mr. J. T. Taylor explained its construction and action, showing wherein it differed from others, and the advantages which the introducer claimed for his burnisher as compared with others. [These having already been explained in this Journal need not here be re-stated.]

Mr. F. W. HART observed that he would like to see the subject of burnishers discussed from the patent point of view. It was intolerable to read the threats that were constantly being advertised against persons who used burnishers other than those of a certain kind. To his knowledge print burnishers had been used in this country for over twenty years.

Mr. TAYLOR was of opinion that the present meeting was not one at which the legality of any patent could be discussed; but he thought that a legitimate question for discussion arising from the explanation he had given of the burnisher before them was the comparative advantages of straight *versus* diagonal burnishing, for in that lay the difference between stationary and oscillating burnishers; and it so happened that Cleary's burnisher could lead to a solution that was understood to exist with regard to this matter, inasmuch as by a slight alteration it would burnish pictures in both ways.

The CHAIRMAN expressed a hope that Mr. Taylor would bring forward the subject at the next ordinary meeting of the Society.

Mr. WILLIAM BROOKS gave an explanation of the mode of masking negatives which he had introduced at the June meeting of the Society. For the benefit of any who may have overlooked the paper in which this very clever mode of masking was fully described by Mr. Brooks, we may say that it will be found at page 293 in our number for June 18th of the present volume. To this article we direct attention.

Mr. FOXLEE read a short practical paper on *A Simple Method of Printing Ornamental Borders, &c., to Carbon Pictures*. This communication will be found in another column. Mr. Foxlee very fully illustrated his subject by the exhibition of masks, negatives, and finished prints.

After an observation by Mr. HOWARD on the advantages of using bisecting lines on the back of a mask, in order to secure registration,

Mr. SAMUEL FRY complimented Mr. Foxlee on the excellent and practical nature of the subject introduced by him. In his own practice he adopted the plan of tinting direct in the camera.

Mr. FOXLEE then described a very simple method of embossing a print without the aid of an embossing-press. All that was requisite was a thin plate of brass or zinc with an oval or other form of aperture cut into it, a thick plate of glass, and a convenient rubber or burnisher. He (Mr. Foxlee) at the meeting operated with the upper end of a stout glass stopper of a bottle. The metallic mask was placed over the *carte* to be embossed, which, with the mask, was placed face downwards upon the plate of glass, smart friction being then applied by means of the rubber upon the back of the picture. Mr. Foxlee, by this appliance, produced a beautifully-embossed portrait in less than a minute, which was submitted to the meeting and received with applause. He (Mr. Foxlee) further directed attention to four fine carbon prints of marine subjects, by Colonel Stuart Wortley, which were hung on a screen behind the Chairman.

Mr. MURRAY, of Guildford, alluding to an article on rapid filtration which had appeared in THE BRITISH JOURNAL OF PHOTOGRAPHY, explained a method of folding a sheet of filtering-paper by which a zigzag fold was produced, allowing of the liquid passing through with great freedom. He further showed in what way the bursting open of the apex of the conical filter could be remedied by simply tying a bit of thread round it. He (Mr. Murray) also explained a method of filtering collodion adopted by him and used with great satisfaction. Details of this method will be found in another page. Mr. Murray said that he would send the collodion filter described to the office of THE BRITISH JOURNAL OF PHOTOGRAPHY, where one of the Editors would perhaps show it to any who might feel desirous of seeing the filter. [We have since received it, and shall retain it for inspection at our office for a week or two before returning it to Mr. Murray.]

Mr. TAYLOR exhibited a chromo-Woodburytype, the first of a new kind of picture introduced by Mr. Woodbury. He gave a brief explanation of its nature, but further details will be found in another column. He (Mr. Taylor) also exhibited an ingenious portable tent made by Mr. Bainbridge, of which we shall give a description in our next issue. Mr. Taylor further exhibited a photographer's note-book which Captain Fox, of Lutterworth, had had prepared for the use of himself and a few friends. It contained special columns for making entries of the kind of lens and stop employed on any particular occasion, the character of the light, the subject, the exposure, the number of the negative, and other items suggesting themselves as desirable to record at the time of exposing the picture. If space permit we shall give a specimen page of this book next week.

Mr. W. T. WILKINSON explained a neat mode of lifting out of a bath any plate which may have fallen from the dipper. It consisted of a piece of wood with a wedge-shaped cleft at the lower end. This, when pushed down into the bath, grasped the plate tightly and allowed it to be pulled up without necessitating the emptying out of the solution.

He (Mr. Wilkinson) also exhibited the flat tilting bath introduced last year by Mr. H. J. Burton, and explained the advantages accruing from its use. A negative having intensely-opaque blacks was also exhibited as showing the power of obtaining great intensity by a process of intensifying with cyanide, as described by Mr. Burton in 1873.

Mr. J. Werge exhibited a copying-frame by which *cartes* or other pictures could be quickly adjusted in front of the camera ready to be copied. By covering the skeleton of the framework with thin tissue paper the light fell in such a diffused manner upon the *carte* as to prevent the texture of the paper being seen. By throwing a dark cloth over the frame it was converted into a capital arrangement for making transparencies in the camera.

Mr. Hughes spoke highly of this method of copying *cartes*, having had it in use for some years. The only drawback to it was the facility it afforded to pirates.

Mr. Hughes exhibited and explained the nature of the French easel, and showed its adaptability to the requirements of photographers who had occasion to produce enlarged negatives. It possessed the power of inclining the large plate of glass on which the negative is to be impressed at any vertical or horizontal angle, permitting also of its being adjusted with respect to height.

Mr. Preston, of Penzance, with reference to an observation made by Mr. Hughes, said that he adjusted the position of his enlargements on the sensitive glass by using a cap fitted with coloured glass.

Mr. F. Howard suggested the use of the common clothes-horse as a support for the enlarged plate.

Mr. Hughes explained the nature of the Howarth warming stove by means of a model which had been sent for exhibition. A full account of this stove having recently been published in our pages we refer the reader to that communication.

Mr. Preston spoke of another kind of stove in which provision had been made for obviating the drying of the air consequent upon the use of stoves of that description; but

Messrs. F. W. Hart and Hughes explained that a special feature of the Howarth stove consisted in its not interfering with the moisture of the air, as its sole function lay in sending into the studio a current of warm air not robbed of its moisture in any way.

Mr. Nesbitt described a contrivance he had adopted for measuring the time when exposing a plate in the camera for any period exceeding about a minute, and which, although he was aware of its having been used by others, might yet be new to some present. It consisted in putting a small black mark inside the glass of a watch, which should be fitted so as to turn round in the case somewhat easily. The black mark, which might be made with ink, was set so many minutes in advance of the hand as it was desirable the exposure should last. The photographer then could give his mind to other matters, with an occasional glance at the watch, until the hand corresponded with the mark.

Mr. Hughes exhibited a piece of apparatus for obtaining a supply of warm water in a few seconds after the water was poured in cold. He found it exceedingly convenient for carbon printing. Details of this will be found in another column.

Mr. Warnerke made a verbal communication (which he has since reduced to writing, and which will be found elsewhere in the current number) relating to the production and development of pellicular negatives. He made a practical demonstration of his method of developing before the meeting, using a very ingenious tray, of which we give a special description in the present number.

Mr. Samuel Fry explained his method of treating wastes. [See page 560.]

Some remarks by Messrs. Hart and Preston followed the communication made by Mr. Fry.

Mr. Baynham Jones exhibited an ingenious swing-back arrangement for a camera, being of the nature of a short gusset attached to a frame which fitted into the camera like a dark slide. Our space being already under such heavy pressure we are prevented this week from preparing a diagram to show the precise nature of Mr. Jones's adaptation.

Mr. Dallas exhibited a specimen of Dallastint, and Mr. Brittlebank a type-printing machine; and with the reading of a letter from Mr. Winstanley, enclosing a chart showing the intensity of the light at Blackpool, the proceedings terminated, the numerous visitors present being apparently much gratified with the entire proceedings at this useful and practical meeting.

## AMATEUR PHOTOGRAPHIC ASSOCIATION.

A council meeting of this Society was held on Thursday, the 11th inst., at 12, York-place, Portman-square,—Sir Antonio Brady in the chair.

The minutes of the last meeting having been read and confirmed, the following members were elected:—Jabez Greenwood, Esq., B.D.; Charles H. Cosens, Esq.; William Muller, Esq.

The Secretary then laid before the Council the prizes awarded at the last meeting, which were as follow:—*First Prize*—J. W. Richardson, Esq., a large silver goblet, value £8 8s.; J. W. Richardson, Esq., an oil painting in frame; Lord de Ros, a silver goblet; Colonel Rocke, an oil painting in frame; W. S. Hobson, Esq., a silver goblet; Dr. Brown, a silver goblet; J. C. Stenning, Esq., an oil painting in frame; R. O. Milne, Esq., an oil painting in frame; Colonel J. R. Turnbull, a large album, elegantly bound in morocco; Captain G. F. Smith, an oil painting in frame; J. McAndrew, Esq., an album, elegantly bound in morocco. *Dry-Plate Prize*—R. Murray, Esq., an oil painting in frame.

It was proposed by Mr. Glaisher and decided by the meeting that the prizes and prize pictures should remain on view at 12, York-place, for the ensuing fortnight. A. J. Melluish, *Hon. Sec.*

## MANCHESTER PHOTOGRAPHIC SOCIETY.

This Society met at the Memorial Hall, on Thursday evening, the 11th inst.,—W. T. Mabley, Esq., President, in the chair.

After the routine business had been concluded Messrs. C. Burton and J. Ambler were elected members of the Society.

Mr. Chapman exhibited one of Turnbull's triple-wick lamps, which was tested against the sciopticon lamp, and pronounced inferior to it. The Turnbull flame was larger and less pure in quality, and not equal to the sciopticon lamp in illuminating the screen.

Mr. Coventry exhibited a camera front carrying seven lenses, three pairs of different foci for stereo. work, and a central one for larger views, and so arranged to revolve that any pair, or the centre one, could be used, excluding the others in the most effectual manner. He (Mr. Coventry) also exhibited some emulsion and one collodio-albumen negatives.

The Secretary laid the *Bulletin* of the Belgian Photographic Association on the table.

Mr. Coote exhibited some choice specimens of collodio-albumen negatives, being part of his summer's work.

During the evening the Rev. Canon Beechey, M.A., ex-President, unexpectedly entered the room and was received with a hearty burst of applause. The Rev. Canon described his new mode of preparing emulsion plates.

The customary votes were passed, and the meeting was adjourned.

# Correspondence.

## "THE DISCOVERIES OF MR. M. CAREY LEA."

*To the* Editors.

Gentlemen,—When one man wishes to attack another he should get his facts up very carefully, or he runs the risk of making himself ridiculous.

Mr. Howarth, who writes in your last number, has got up his facts very erroneously. He states in effect that when I first spoke of uranium in an emulsion I claimed that it added to the sensitiveness of the plates, and that months afterwards, as the result of accident and not of chemical perception, "*it was found*" that the presence of nitrate of uranium had the additional property of preserving the emulsion.

In order that your readers may see how entirely erroneous Mr. Howarth's statement is, I beg you to print the following in parallel columns:—

| *From Mr. Howarth's letter in your issue of last week:—* | *From Colonel Stuart Wortley's paper read before the Dry-Plate Club, and published in* The British Journal of Photography *of April* 12, 1872, *being the* first publication of the urano-bromide emulsion:— |
|---|---|
| "Colonel Wortley afterwards condemned *in toto* the use of a mineral acid, stating that uranium plates were much more sensitive than any prepared by Mr. Lea's formula. Months afterwards uranium was found to possess the additional property of preserving the emulsion; this I regard as accidental, and not the result of chemical perception." | "My search has been particularly directed to *two* points—one the obtaining of a negative by a dry process which should have as much delicacy and quality as a wet negative, in opposition to the hardness usually associated with dry plates; and another the preparation of an emulsion that will keep without change for a month or six weeks. To do this I have availed myself of certain properties possessed by the nitrate of uranium." |

And in that same paper I recommend the use of *nitric acid;* in fact, it is part of my formula.

These misstatements by Mr. Howarth are very serious, and it is laughable to notice his futile attempt to disparage or depreciate my work. You and many of your readers are aware that since the introduction of the Wothlytype process I have constantly and closely been engaged in experimenting with uranium salts in photography.

It is amusing to find, after my eight years' working with this salt in every possible form and combination, from its introduction to collodion in 1864 to my publishing its value for emulsion work in 1872, Mr. Howarth regarding my discovery of its keeping properties in an emulsion as accidental! I dare say, however, his opinion will not, after this exposure of his errors, weigh very much with your readers.—I am, yours, &c., H. Stuart Wortley.

*Rosslyn House, Grove End-road, N. W., November* 15, 1875.

## RESIDUES.

*To the* EDITORS.

GENTLEMEN,—In continuation of your recent notes on residues I enclose a sample of a hitherto undescribed sort. It is a deposit from an old porcelain dish used for hypo.

I do not use porcelain in summer, but a wooden dish, pitched inside. In winter, however, the porcelain is more convenient, as a gas jet can be burned underneath to warm the solution, and then turned down to keep the temperature uniform; also the wooden dish is rather too large for the quantities of prints usually obtained at that season. The porcelain has served me for several winters, and had gradually got rather rough at the bottom, whether from a decomposition of the glaze or a hard deposit I could not for some time make out; indeed, I never examined it very closely, except so far as to discover that no ordinary rubbing would remove it. This winter, when about to start the porcelain dish, I noticed that the deposit appeared to be rising and becoming detached from the bottom; in fact, with little difficulty, the whole came away in a thin sheet, some portions of which I enclose.

I have tried an examination with the blowpipe, but cannot make it out. This, however, is probably owing to my want of skill; but its refractory behaviour led me to doubt whether it is a deposit of sulphuret of silver (the most obvious explanation) or a sort of supplementary glaze put on the dish, which does not appear to be injured, the glaze underneath seeming good and sound.

I may add that my hypo. solution is alkaline, as I always use carbonate of ammonia. The used solution stays in the dish till next day, when it is poured away and replaced by fresh, just before the pictures are fixed, so there is plenty of time for it to make any deposit it may feel inclined to do.

Excuse me if I presume on your zeal and kindness in sending you some of the stuff for examination and subsequent report.—I am, yours, &c., RUSSELL SEDGFIELD.

*Norbiton, November* 12, 1875.

P.S.—I find that the specific gravity is about five and a-half. I do not know what sulphuret of silver is, but surely it must be more than that.—R. S.

[The residue enclosed by our correspondent is in the form of scales of a dark greyish-brown colour, and would at first sight appear to be some compound of silver and sulphur. Upon roughly testing the substance under the blowpipe, however, no traces of sulphur fumes are discernible, and fusion is impossible, the only effect of the heat being to slightly alter the colour. We have not yet had time to make as careful an examination of the matter as we should wish.—EDS.]

## "SILVER OR CARBON?"—AUTOTYPE MONOPOLY.

*To the* EDITORS.

GENTLEMEN,—In your issue of the 5th "An Old Photographer" discourses on the relative merits of printing in silver or carbon, and upon summing up his case he feels himself pretty securely entrenched against the revolutionary tendencies of carbon. But, in last week's Journal "An Old Carbon Printer" storms the position with such audacious vivacity that on the technical questions involved my firm would be unwise to enter the lists. Indeed, the modesty born of a lengthened experience might have prevented the expression of such confidence in the perfect facility of processes which, while making great strides towards perfection, have by no means yet reached that goal. But it is the question of "close monopoly" raised by both writers, and touched upon so differently by each, which induces me to carry the topic a little further.

"An Old Photographer" assumes with some reason the "monopoly" as a general patent fact, and with not unfair logic marshals that as one reason among several why silver printing is not likely to be soon abolished. "An Old Carbon Printer," on the contrary, with a vaunting courage, admits no "monopoly," and generously offers his personal guarantee to hold harmless against consequences anyone who for his advantage will violate the supposed rights of the present owners of the autotype patents. "These be prave worts," but should have the weight and influence of a personal signature, and not the hazy indistinctness of a *nom de plume*.

As to "monopoly," it is very generally known by all persons well informed in contemporary photographic history that the autotype process, like many another invention of high merit in the arts, has absorbed the time, devoured the substance, and wearied the hearts of most of its early votaries. Up to the present moment (the writer has very good means of knowing) an average of all the balance-sheets of autotype would show a loss exceeding twenty thousand pounds. To bring carbon printing to its present stage the battle has been long and severe, the sacrifice of time and money prodigal; and, as the free use of the patents for landscape and portraiture have for years been given to the profession on the sole condition of purchasing the material from the patentees, the complaint against "monopoly" cannot be very grave.

On the other hand, most honest people will think that if, through undaunted perseverance, carbon printing is at last promising some commercial success the reward may fitly come to those who have worked and paid for it. "There be land sharks," however; and, unless your correspondent has simply penned a thoughtless sentence (which no doubt escaped your observation, Mr. Editor), he may rest assured the material exists to test the value of his personal guarantee so freely offered. The validity of long-established patents may be honourably called in question at any time; but genuine valour qualifies itself by an anonymous stab.

However, my firm feels more securely protected by the inherent difficulties of autotype manufacture and the business principle of giving the best possible article for the money than even by its patent rights, although these having cost a good round sum in cash are estimated as "property," and as not without legal rights.—I am, yours, &c.,

36, *Rathbone-place, W., November* 15, 1875. W. S. BIRD.

## DECOMPOSITION OF HYPOSULPHITE OF SODA.

*To the* EDITORS.

GENTLEMEN,—I notice in your last issue an unanswered query with reference to the decomposition of hyposulphite of soda. I have been troubled in the same manner as "R. J. T.," and shall be glad if the remedy I found quite efficacious may prove equally so in his case.

I was in the habit of preparing a large quantity of hypo. solution at a time to use from, and I noticed that the prints always lost tone more in the old than in the freshly-prepared solution. This led me to test the old solution in various ways, and I found it to be decidedly acid. I then tried the addition of ammonia, and fixed a batch of prints—one half in the alkaline bath thus prepared, and the other half in another portion of the same solution without any addition. The first half bleached much less than in an ordinary freshly-prepared hypo. bath, but the others came out almost as red as if they had never been toned at all. The acidity of the solution is thus an evident cause of red prints.

The quantity of ammonia must depend, of course, on the acidity present. I generally find about a drachm to each pound of hyposulphite sufficient, but a slight excess does no harm. Perhaps "R. J. T." uses the same fixing bath more than once; if so, loss of tone will follow with certainty.—I am, yours, &c., H. S. W.

## SILVER *VERSUS* CARBON.

*To the* EDITORS.

GENTLEMEN,—Seeing the great importance of permanent printing, and the attention it seems to have received on the continent, I have been somewhat surprised at the comparatively small amount of correspondence there has been in your columns respecting carbon printing.

The letter of "An Old Photographer" does contain some facts, and I trust it will cause profitable discussion as to the merits or demerits of carbon printing as applied to our everyday business, and induce some of the able and experienced workers to give your readers the benefit of their experience.

From what I can gather from about four months' assiduous working I do not see any insuperable objections or difficulties to printing all small work in carbon, but there are at present some drawbacks.

First:—I will put the variable quality of the tissue, having found great difference in lots obtained at different times.

Secondly:—The state of the atmosphere—now dry and now damp, hot and cold—all affecting the result to some extent. In very hot weather very great annoyances occur, and I am afraid that, except in very completely-appointed establishments, it will be almost unmanageable during hot weather.

Thirdly:—Vignetting seems very difficult, or, at anyrate, there is considerable difficulty in getting results comparable to albumenised paper.

Fourthly:—There are many more operations and more difficult manipulations required.

Fifthly:—Difficulty in producing effects, tinting down parts, local shading, &c.

Sixthly:—The expense (I think this is what "An Old Photographer" means, and not "exposure" as printed) is about *four* times greater than that of silver printing.

As to the surface of carbon prints I think there is ample choice, and certainly no drawback that I can perceive. But the greatest fault I have met with is one that, unless overcome, will effectually retard, if not stay, the progress of permanent printing. It is that it seems impossible to obtain prints from good average negatives at all approaching in depth, vigour, and brilliancy those that the same negatives will give on albumenised paper. I have got carbon prints which I considered perfect; but, when put by the side of silver ones, they were much inferior. Whether it is, as I fancy, from insufficient pigment incorporated with the gelatine I do not say; but I have not yet obtained results possessing the depth and force I obtain in my silver prints. The deepest blacks of the carbon print allow the white transfer paper to show through to some degree, and the result is flat and weak. By stumping up the deepest shadows a very great improvement is effected; but, unfortunately, we cannot rely upon being able to do this upon each of our *carte* and cabinet prints.

What we require is a tissue that will give, without doctoring, results as forcible and brilliant as the same negative gives by the ordinary method. I find, in my practice, very dense negatives give the best carbon prints; but, as these are my exceptions, I want to be able to print any fair average one and obtain a print that will compare not unfavourably with a silver one.

I should have stated that the foregoing remarks apply to the chromotype process, which is admitted to embody all the latest improvements.

Much more might be said; but I conclude, sincerely hoping that the day is not far distant when permanent photographs will supersede the present beautiful but unstable silver prints.—I am, yours, &c.,

A Young Chromotype.

*Queen-street, Norwich, November* 16, 1875.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

*** Owing to the unusual length and interest attaching to the Technical Meeting of the South London Photographic Society, and our desire to include the whole of the transactions in the present number—a desire which, after all, we have not been quite able to accomplish—numerous articles, letters for publication, answers to correspondents, reviews, and notices of new books, have been unavoidably left over till next week. Included in the foregoing are a leading article on MM. Rottier and Waldack's reply to our former article on *Experiments with Iron Developing Solutions;* our usual article on the Photographic Exhibition; articles on *Building and Warming Studios*, by Mr. J. W. Gough; on *Colour and its Appreciation*, by Mr. E. Dunmore; *Notes from the North*, by Dr. Nicol; and *Notes on Dry-Plate Work*, by Mr. M. Carey Lea. Also, reviews of Gaston Tissandier's *History and Handbook of Photography* (Sampson Low and Co.); *Views of Orkney and Shetland*, by G. W. Wilson; *The Sciopticon Manual* (third edition); T. J. Middleton's *New Catalogue of Dissolving View Apparatus;* York's *Lantern Readings;* Captain Waterhouse on *Photography in Connection with the Transit of Venus;* Deveril's *Photolithography as Practised at the New Zealand Government Photolithographic Department, Wellington; Views of Yorkshire Abbeys*, by Mr. Wormald; illustrations showing the permanence of silver prints, by Mr. W. M. Ayres; Mr. Stephen Thompson's *Studies from Nature, Part III.;* and others, which we hope to attend to in our next number.

Mystery.—The prints look as though they had either been sensitised on a very weak silver bath or floated upon the bath wrong side down. Unless we were made acquainted with the details of your manipulation we could not offer a solution, the defect in question arising from so many causes.

W. Muller.—We cannot undertake to give lessons in any department of photography in our "Answers to Correspondents." There are several good manuals, by the perusal of which you might acquire a knowledge of the art—such an amount of knowledge, at anyrate, as it is possible to obtain through reading.

J. H. Swain.—Size the paper with gelatine so as to retain the image on the surface; salt with iodide and bromide of potassium; excite with aceto-nitrate of silver, and develope with a hot solution of gallic acid. By the quantity of silver added to the developer the tone may be regulated from a warm red to a sooty black.

R. S. W.—We believe we are correct in saying that no licenses whatever are, or will be, granted for working the aniline process. But no reflection must be made upon Mr. Willis for this exclusiveness, seeing that the right of property in the patent passed out of his hands several years ago. Had the recently-proposed patent reform bill become law you could have compelled the proprietor to grant you a license; but under the existing patent laws there is no help in your case.

P. P. P.—The judge was quite right; the portrait certainly partakes, to a great extent, of the nature of a caricature. It looks as if the camera had been placed *very* much below the level of the sitter's face, and as if he then were told to direct his eyes towards the ceiling. For the sake of your own reputation we advise you to say as little as possible about the matter. Much better and wiser will it be for you to frankly admit that it was an error of judgment on your part. By the exercise of a little and prudence all may yet be made right.

H. M. (Amateur).—1. The focus of your lens can be increased in the manner proposed.—2. If ordinary spectacle lenses be flat, as you imagine, "and neither concave nor convex," in what way do you suppose they would aid those having defective vision? The glasses respecting which you inquire are known in the trade simply as convex or concave spectacle lenses.—3. The more that a concave lens is reduced in diameter the thinner does the edge become.—4. No.—5. Your drawing is correct in all respects except one, namely, C does not represent a lens, but a piece of curved glass of uniform thickness. A *lens* placed in the position of C would exercise a powerful effect upon the focus of the objective.

William B. Smith.—"Magic photographs," so called, are made by printing as usual from a negative on plain salted or albumenised paper. Fix, without toning, in hyposulphite of soda, and then, after washing, immerse in a saturated solution of bichloride of mercury, which will cause the picture to disappear. It is again washed and dried. To cause the image to appear with even greater vigour that it previously possessed, all that is necessary is to lay upon it a piece of blotting-paper which has been previously immersed in a solution of hyposulphite of soda, and afterwards dried. This, upon being moistened with ordinary water, is pressed against the invisible photograph, which is *instantly* developed with great intensity. Photographs of this kind form a source of pleasure and amusement at the social table, and you, as well as other photographers, may advantageously introduce them in connection with the approaching festive season of Christmas.

Puchy.—1. Some details of the hot-water process were given a few months ago, probably in the Journals forwarded to you to the Andamans. We repeat the details, and if they are too meagre write again:—Sensitive as usual, the bath being rather acid; wash thoroughly; apply diluted albumen—the white of an egg to three times its volume of water, well whisked together and allowed to subside; care must be taken that it flows over every portion of the surface, and a little time allowed for it to penetrate. Now immerse the plates in very hot, if not boiling, water for a few seconds; then apply a three-grain solution of gallic acid, and the operation will be complete. Let them dry either spontaneously or by heat. Develope either with plain, acid, or alkaline pyrogallic acid. With respect to lenses: A is most rapid, excelling to a considerable extent B and C, which are nearly identical in form of construction and rapidity of action; D is somewhat slow. The gentleman named has not changed his address. We regret the circumstance compelling your return to Europe, and hope that your health will soon be thoroughly restored. On perusal of the paper by Mr. Warnerke in the present number you will find much that will interest and probably aid you; for by the adoption of a flexible sensitive plate which will adapt itself to a cylindrical form, the difficulty of obtaining marginal definition with a portrait lens will be greatly reduced.

☞ **Editorial Communications should be addressed to "THE EDITORS"—Advertisements and Business Letters to "THE PUBLISHER"—at the Offices, 2, York Street, Covent Garden, London, W.C.**

Lambertype.—As will be seen from our advertising columns, M. Lambert, in the course of his journey through the northern counties, is now in Liverpool. During the last week he has been giving daily demonstrations at the studio of Mr. Ferranti, in Bold-street, and such has been the satisfaction which M. Lambert's results have given that he has disposed of several exclusive licenses—Mr. Ferranti himself and Mr. Walter Clayton (of Nottingham) having each secured four licenses for as many towns, Mr. Laing (of Shrewsbury) taking out licenses for three towns, while several others have paid for one or two in their own particular districts. The specimens, which embrace every stage of the various processes, have given great satisfaction, and will remain on view at Mr. J. J. Atkinson's, 37, Manchester-street, until, at least, Tuesday evening next. Our readers who are interested in the Lambertype demonstrations and specimens will do well to consult the advertisements of M. Lambert and Mr. Atkinson, to be found in the usual advertising pages in the present number.

A Photographic Advertising Swindle.—An appeal case (Regina *v.* Cooper), which came before the judges in the High Court of Justice on Saturday last may prove useful in placing photographers and others on their guard against such impositions:—The prisoner in this case was convicted at the Northampton Quarter Sessions of obtaining money under false pretences, subject to the question reserved and raised by this case whether two hundred and eighty-one letters which were put in by the prosecution were admissible. Mr. Jacques argued for the prisoner; Mr. Merewether in support of the conviction. The prisoner was proved to have advertised in the *Daily Telegraph* as follows:—"Two and sixpence per hour easily earned by beginners (either sex) by preparing *carte-de-visite* papers at their own homes at eightpence per dozen. Employment permanent. Trial paper and instructions, 1s.—Davis Brothers, Hardingstone, Northampton." On the trial it was proved that the prisoner inserted the said advertisement; that there was no such firm as Davis Brothers at Hardingstone; and that the prisoner was not in a position to give permanent employment. Six envelopes, each directed as above, containing answers to the advertisement and twelve postage stamps, were found in the possession of the prisoner on his being apprehended. Two hundred and eighty-one other letters were produced by the chief clerk of the post-office at Northampton in a sealed bag. The letters had also been addressed to the prisoner under the title of "Davis Brothers, Hardingstone," in reply to the said advertisement, and had been received at the office in like manner as those before mentioned, but, having been stopped by the post-office authorities before they had been delivered, none of the two hundred and eighty-one letters had ever been in the prisoner's possession or custody, nor was any proof adduced that they were written by the persons from whom they purported to come; but each letter had been opened by the post-office before production at the trial, and each contained twelve stamps. The question for the Court was whether these letters ought to have been admitted as evidence against the prisoner. Lord Chief Justice Coleridge delivered the judgment of the majority of the Court that they were so admissible, and that the conviction must, therefore, be affirmed.

CONTENTS.

THE BRITISH

# JOURNAL OF PHOTOGRAPHY.

No. 812. Vol. XXII.—NOVEMBER 26, 1875.

## ON CURING EXISTING DISTORTION.

So much has been already written concerning the nature of distortion, the conditions under which it exists, and the various means by which it may be avoided, that we should pay a very poor compliment to the intelligence of our readers if we were not to assume their possession of a pretty clear understanding of the matter. Architectural photographs with converging perpendiculars are now—thanks to incisive criticism, cultivated taste, and portable spirit-levels—becoming things of the past; and photographs having curved lines at the margins in the place of rectilinear lines, are now—owing to improved optical resources—very nearly unknown. We must qualify all this, however, by the addition of the words "in this country;" for in several large and otherwise excellent architectural views taken by continental artists, and which we have lately examined, we have perceived sad indications of the want both of spirit-levels and suitable lenses.

What we have to treat of in the present article is the best means of curing distortion already existing in a photograph. In short, taking the case of a photograph distorted to an almost hopeless extent, being the victim of all the mal-linear evils that can affect pictorial projection, the question arises—By what means are such evils to be eliminated, so as to leave the photograph what it should be—a fair and truthful representation of nature?

The subject, when duly examined, becomes narrowed to two points—the restoration of converging lines to a condition of parallelism, and the bending back of curved lines into a state of straightness; and these we take in their order.

The restoration of parallelism of converged lines in an architectural photograph can be effected with great certainty and a moderate degree of simplicity, by copying either the negative or the print with a non-distorting lens of as short a focus as is compatible with the covering of the plate sharply when used with a very small stop—a wide angle and a small stop being essentially necessary in order to produce the best results. If a camera fitted with such a lens, and capable of being extended to twice the solar focal length of the instrument, be placed straight and squarely before the negative or picture to be rectified, it will be found upon focussing the image the size of the original that the latter will be exactly reproduced, all the distortion of the original appearing in the copy. But if the top of the original, or that side or end *towards* which the lines converge, be placed a little out of its square position by being inclined forwards towards the camera, it will be found that in proportion as the picture is tilted forward so does the convergence disappear upon the ground glass, until at a certain stage the lines become absolutely square and parallel. At that stage the picture must be fastened securely and the negative taken.

This negative will produce a print precisely similar to the original, subject to two exceptions—first, the distortion of convergence will be found to have entirely disappeared; and, secondly, owing to the tilting of the picture, the proportion of the height to the breadth will be slightly altered, the proportion of the alteration being less with a lens of short than with one of long focus.

In most instances it is probable that the diminution of the height will be so slight as not to be observed; still, where absolute accuracy of proportion is required, this may be secured by recopying the picture and placing it *this time* at a considerable distance from the camera.

The finished picture which results from these operations will not be, externally, as square as the original, but will be slightly wedge-shaped. This is obvious when we consider that the practical effect of what has been done is to widen the picture at one end so as to pull out the converging lines into the required parallelism. By the proper use of the trimming-knife the resulting prints are made quite square and straight.

The principle to be observed in the straightening of the curved marginal lines in a photograph is similar to that we have just described in another application. If the distortion of curvature have been caused by the employment of a landscape lens having a stop in front, the form assumed by the curvature will be the kind known as "barrel-shaped" or "outward curvilinearity." The remedy for this is the exceedingly easy one of reproducing the picture by means of a lens made, by adjusting the position of the stop, to give distortion of the "pincushion" or opposite character.

## HYPOSULPHITE OF SODA.

There is probably no substance used in photography against which so many charges of "misconduct" has been brought as that which heads this article; and, while we are willing to admit that many of these charges should more properly be brought against the faulty manipulation of those who use it, there can be little doubt that in too many cases it has been the source of many failures. Notwithstanding this, however, it still maintains its ground as one of the most useful and generally-used substances in the photographic laboratory. This position it holds in consequence of the fact that it is one of the most convenient solvents of certain salts of silver, or, to put it more correctly, because it readily combines with certain salts of silver to form hyposulphite of silver, which is soluble in excess of the alkaline hyposulphite, and that the soluble salt thus formed is more or less easily and perfectly removed from the insoluble image which has been formed in or on the film or supporting body.

Our attention has been directed to this subject in consequence of several communications we have received—some having appeared in our columns—in which doubts were raised as to the quality of the article with which our correspondents had been supplied; so we resolved to examine into the matter a little more fully than we had hitherto done, and, by experiments on a number of samples collected from various sources, ascertain how far uniformity of product had been attained by the various manufacturers of the substance.

Hyposulphite of soda was first noticed by Chaussier in 1799, when he claimed for it certain medicinal virtues which subsequent experience did not corroborate; and it affords another of the many striking illustrations of the impetus given to certain branches of manufacture by the advent of photography. Previous to its use in our art-science it was a somewhat rare substance, and, being produced in small quantities by a rather roundabout process, cost per pound almost as much as it is now quoted at per cwt. But we are not sure that, in

this case at least, reduction in price in consequence of increased consumption has been followed, as it very often is, by improvement, or even uniformity in quality.

Of the many processes by which hyposulphite of soda may be produced that which we are about to describe is probably the best, as it yields a perfectly-pure article with little trouble and, as we had the pleasure of seeing it recently, with perfect certainty.

A large still of cast iron is charged with sulphur, and heated by an open fire from below. By a suitable arrangement a stream of sulphuric acid is allowed to flow into the still and come into contact with the melted sulphur. In this way two molecules of sulphuric acid give up each an atom of oxygen, which, uniting with one atom of sulphur form three molecules of sulphurous acid, thus—$2\,S\,O_3 + S = 3\,S\,O_2$. The sulphurous acid is led, by a suitable prolongation of the still-head, into a digester or large vessel, which is filled with crystals of carbonate of soda. The digester has a perforated false bottom on which the crystals are packed, and the gas is forced in between this and the bottom proper. In this way it is brought into contact equally with the whole body of crystals, and, after the action has continued some forty-eight hours, the whole mass is found to be converted into the acid sulphite of soda, with liberation of carbonic anhydride. This acid sulphite ($Na\,H\,S\,O_3$) is then dissolved in water and converted into the neutral sulphite ($Na_2\,S\,O_3$) by the addition of as much carbonate of soda as was previously used. To the boiling solution of neutral sulphite a quantity of sulphur is lastly added, and after the heat has been kept up for some time each molecule of the salt combines with an atom of sulphur, and hyposulphite of soda is the result, thus—$Na_2\,S\,O_3 + S = Na_2\,S_2\,O_3$. When the combination between the neutral sulphite and the sulphur is complete the clear liquor is pumped or run into large wooden troughs, where the salt crystallises in the form in which it is met with in commerce.

This we believe to be the best process of manufacture; but we were assured by the manufacturer at whose works we saw the operation carried on that from the price at which the article is frequently quoted—from twelve shillings to fifteen shillings per cwt.—it was not the one generally adopted. It is, therefore, much more likely that it is formed from some waste product; and as various manufacturers may use different materials it is not improbable that, while the chemical constitution of the salt may be in all cases alike, the incidental and accidental impurities may vary materially. With a view to ascertain roughly how far this is the case, we recently procured a number of samples of ordinary commercial hyposulphite of soda, and made a large number of comparative experiments in relation to their solvent power on chloride of silver and the blue iodide of starch.

In the first place, the samples varied considerably in appearance. Some of them were in large transparent crystsls and perfectly dry to the touch, while others were small and semi-opaque, and evidently somewhat deliquescent. Most of them had an alkaline reaction, one or two were quite neutral, and one was decidedly acid. A sample made as previously described, and which from previous experiments we knew to be of good quality, was taken as a standard, and made to act on chloride of silver and iodide of starch in the following manner:—A solution of the hyposulphite was made (of such a strength that each cubic centimetre contained one grain) and placed in a suitable burette. Then five grains of nitrate of silver were dissolved in a test tube, and converted into chloride by chloride of sodium, and well washed. Into this the solution of hyposulphite was allowed to flow—freely at first, but drop by drop as the chloride dissolved; and when that was accomplished the quantity of liquid used was read off and noted. In the same way the iodide of starch from one grain of pure iodine was treated, and a mean of several experiments gave the following result:—5·8 grains of hyposulphite were required to dissolve the chloride formed from five grains of nitrate of silver, and ·8 of a grain was required to decolour the iodide of starch from one grain of iodine. This, as we expected, was the highest result obtained, the other nine samples requiring from 8·7 to 6·6 for the nitrate of silver, and from 1·3 to ·9 of a grain for the iodide of starch.

Now, although there is, doubtless, considerable latitude allowable in the strength of the solutions of hyposulphite used in photography, such a difference as that between 5·8 and 8·7 in the solvent power of the article must to a considerable extent interfere with anything like exact, uniform work; and we may, in all fairness, throw out the hint that, although it is desirable to study economy in the purchase of even such an inexpensive article as hyposulphite of soda, it is possible that what may appear the cheapest at the beginning may not prove to be so at the end.

With regard to the keeping qualities of hyposulphite of soda—about which a question has recently been raised—we may say that one of the best samples examined has, to our own knowledge, been in the cask from which we took it for at least seven years, and is apparently as good now as when made. Neither do we think it is liable to change when kept in solution. Hyposulphite, however, that has been once used for fixing prints should on no account be kept and used a second time. The hyposulphite of silver formed in the solution is an extremely unstable body, and begins almost immediately to decompose, the result being the formation, amongst other substances, of sulphide of silver and sulphuric acid. We are aware that it is no uncommon practice with many photographers to keep a portion of used hyposulphite solution to add to that freshly made up, in the belief that thereby the prints suffer less lowering in intensity. The practice is, to say the least, of doubtful advantage—nay, is more than doubtful, so far as safety or security from failing is conccerned.

We have said that some of the samples of hyposulphite of soda we examined gave neutral solutions, and that one was decidedly acid. Now, it is generally conceded that the purity of the whites of a print are best maintained when the fixing solution is decidedly alkaline. In order to secure this condition, we know that many are in the habit of adding to each batch of solution a few drops of ammonia or other suitable alkali; and we believe that if those who have not hitherto done this would give it a fair trial they would find, by so doing, their prints considerably improved.

## EXPERIMENTS WITH IRON DEVELOPING SOLUTIONS.

In a leading article at page 266 of our present volume we recorded the results we had obtained in going over a series of experiments conducted by MM. Rottier and Waldack, and communicated by them to the Ghent Section of the Belgian Photographic Society, the first portion of their report only having been then published. It will be remembered that we, in many points, were at variance with our Belgian *confrères*, who have now published a reply to our article, in which, without adducing any further arguments, they adhere strictly to what was previously stated, though from the general tenor of their remarks we think it not improbable that our experiments have not been made under exactly similar conditions; at the same time, the general circumstances are so far identical that we can as yet see no valid reason for changing our previously-expressed opinions. In our column of *Foreign Notes and News* in the present number will be found a summary of the second portion of MM. Rottier and Waldack's report, in which it will be seen that they considerably modify their former statement as to the value of acetate of iron as a developing agent. The following is the text of the reply, which appears in the last number of the *Bulletin de l'Association Belge de Photographie*:—

"The British Journal of Photography has recently published the results of some experiments made by an anonymous observer on the use of developing solutions containing ferrous salts. Examining successively the whole of the points touched upon in the first part of the report presented by us upon this subject, the author of the work we speak of has undertaken a series of experiments destined to verify our conclusions, and his results disagree with the greater portion of ours.

"Thus, in studying the influence of the strength of the sulphate upon the vigour of the proofs, he has not succeeded in reproducing the effects which we have remarked, and he concludes from his observations that the intensity of the image does not increase with the strength of the solution.

"According to us, on the contrary, the quantity of sulphate of iron contained in the developer exercises a manifest influence not only on the physical nature of the deposit, but also upon the vigour of the

negative. We have remarked, amongst other facts, that, if a developer containing one per cent. of ferrous sulphate produce a negative without detail in the shadows, with an equal length of exposure, &c., another developer, containing six per cent. of sulphate, gives birth to a satisfactory negative.

"But, as we have already remarked, these effects cease to be manifest when exaggerated doses of sulphate are employed. We may add that we have obtained these results with neutral as well as with acid developers. In all cases the presence of acetic acid in the developing solution exercises a slight influence on the nature of the deposit of silver and on the density of the negative.

"The effects produced by the introduction of various acids into the developer have also attracted the attention of our English *confrère.* On this point, as on the preceding one, he has obtained results different to our own. With him citric acid is almost the only organic acid capable of furnishing a black deposit; whilst, in our experience, tartaric, citric, malic, and picric acids, especially the last, have caused black deposits of silver. It will be seen that, in presence of our results and on mentioning the exceptions we have met with, we were justified in saying that the organic acids tried by us have, *in general,* produced black negatives by reflection.

"It will be remarked that we place tartaric acid amongst those which give a black deposit; whilst, according to our worthy opponent, the presence of this substance in a developer causes the formation of beautifully-white images by reflected light, and very suitable for positives on glass.

"The author of the work under review deals, lastly, with the effect produced by the substitution of acetate, nitrate, &c., of iron for the sulphate contained in the developer. As regards the acetate, our English *confrère* remarks that, so far from giving satisfactory results, this salt gives very defective images. The second portion of our report, which has appeared since the publication of the article in The British Journal of Photography, replies sufficiently to the remarks made upon this subject by our opponent.

"Let us now say a few words upon the action of the nitrate of iron. In substituting this salt for the sulphate we have constantly obtained pale images without vigour, and we have also remarked that in our hands it requires a longer exposure than the sulphate, while according to the English journal the two salts act with equal intensity. It is only just to remark that our experiments have been made solely with the nitrate obtained by precipitating a solution of the sulphate by means of nitrate of baryta.

"The complete divergence which exists between our results and those of our opponent shows that in photographic matters more than in any other case it behoves independent experimentalists to adhere strictly to the special conditions laid down, any deviation from which, it is easy to see, may conduce to entirely opposite results.

"The observations we have already made apply with equal force to the employment of the ammonio-sulphate of iron. In our earliest experiments we recognised the fact that this salt requires a shorter exposure than is the case with the simple sulphate; on this point we are in accord, not only with the English correspondent, but with a large number of other photographers. This substance, however, does not always exhibit the same property, and in many cases we have found it to require the same exposure as the ordinary sulphate.

"To cite a new example of the differences which may arise from the conditions themselves under which photographic experiments are made when each operator makes use of his own collodion, his own silver bath, &c., we will say a word upon the discussion which has recently taken place at Berlin between Messrs. Gertinger and Bergersdorff, members of the photographic society of that city, who had undertaken the task of studying the properties of the new developer of ferrous phenate introduced by M. Kruger under the name of 'carbolate of iron.' According to M. Gertinger this developer permits a certain reduction of the exposure, whilst M. Begersdorff has been unable to observe any difference worthy of notice between the effect of the ordinary developer and of the carbolate of iron."

Such is the reply to our strictures which MM. Rottier and Waldack have published in the Belgian *Bulletin;* but, after careful perusal and comparison with what has gone before, we can see no reason to alter what we have said or to repeat the experiments. The divergences of opinion which exist between MM. Rottier and Waldack and ourselves are, we think, partly traceable to variations in the conditions under which the experiments were made, but mainly, we must say, to a misapprehension on the part of the gentlemen named of the terms they use.

The first point noticed is the influence of the strength of the developer upon the density of the negative. In the first portion of the Belgian report it was stated that a weak developer produced a thin metallic image of a violet colour, while a stronger one developed quickly an image of considerable density. This we found in our experiments not to be the case; and MM. Rottier and Waldack, in their reply given above, bring forward in proof of their view a statement to the effect that a developer of a certain strength will produce *more detail in the negative than a solution only one-sixth of the strength.* This is a fact we will not for one moment dispute; but we think it is rather changing the ground of argument to speak of *detail* as synonymous with *intensity* or *vigour.*

To go back to the point at issue: we have no doubt that were a plate, after exposure, divided into two parts and treated, one half with a one-per-cent. and the other with a six-per-cent. solution of iron, for a *given measured time,* the result as regards density of deposit might be in favour of the stronger solution. But such is not the manner in which negatives are usually developed, and our remarks referred to practical development, in which we assert and repeat that, *cæteris paribus,* the stronger the solution the greater the tendency to softness and detail; whilst with a weak solution, though the operation of development will be more prolonged, the result will be harsher in contrast and actually denser than the former one. Upon the point of the colour and physical nature of the image nothing is said beyond that acetic acid exercises a slight influence. Here we must repeat that we have found the effect of the acid to be of at least as great importance as the strength of the solution.

As was stated in our previous article, we confined ourselves in our course of experiments to the use of acid developers, while MM. Rottier and Waldack have made use of both acid and neutral solutions, the results in *either* case being *similar.* This is quite in accordance with our own idea, as we imagine that the simple rule governing the nature of the deposit is that the slower the development the finer and denser will be the deposit.

The next question is the effect produced by different acids when used as restrainers. Upon this point we can say but little more than has been already said. We mentioned citric acid as the only one which, under ordinary circumstances, produces black images by reflection; our Belgian friends speak of tartaric, citric, malic, and picric acids as producing that result; but, with the exception of the last, which we have not tried, we find that, in our hands at least, a contrary effect is produced. In addition to the organic acids already mentioned we may name formic and carbolic as bearing out our view of the question. Still, it is not only possible but very probable that differences in the manner of carrying out the trials may produce even greater divergences of result than the change of acid; for instance, with acetic and citric acids—the two most generally employed—how great a difference may be made in the colour of the deposit by the mere alteration of the time of exposure!

The remaining portion of the article we have here translated, referring to the use of other salts of iron than the sulphate, requires little notice, as in the main it only bears out what we have ourselves said. By reference to the *résumé* of the second portion of MM. Rottier and Waldack's report, published in another page, it will be seen that their more mature estimate of the value of the acetate is scarcely so favourable as the one previously published, but agrees almost entirely with the opinion we ourselves formed of it.

## THE PHOTOGRAPHIC EXHIBITION.

[Concluding Notice.]

Since the appearance of our last notice the Exhibition has been closed; but as the following notes were made prior to that event, and were intended for our last number, we allow them to stand in the *present* tense.

On the table are several articles of ceramic ware adorned with vitrified portraits, among them being a small tea-service.

Several very fine photographic enamels are exhibited by Mr. Faulkner, the tones and gradation being admirable. It has been said that they have been produced by what is known as the "dusting-on" process; if so these pictures attest unmistakably the artistic value of that process.

A charming portrait of a girl (No. 342) is exhibited by Messrs. Evanoff and Goddard. Among the various contributions made year after year by Mr. Ferneley none have ever surpassed—if even they have equalled—six lovely little sketches (337) near Reigate. In Mr.

Gillard's *Orange Blossom* (10) this artist shows his power of grappling successfully with a class of photograph—life size direct—the difficulty of which is universally recognised. Mr. Law exhibits a frame (60) of six very agreeable and well-executed rustic sketches; and Mr. King shows two excellent studies of *Tottenham Trees* (232-3).

Several portrait studies by Miss Paget are strongly suggestive of Mrs. Cameron's style, although they are in better focus than the productions of the latter lady. Mr. Protheroe contributes two frames, each containing twelve admirably-executed portraits in various styles of pose and lighting. With regard to two specimens of portraiture exhibited by Mr. F. Piercy we are somewhat at a loss how to designate them. They appear to be works of art on a photographic basis, but highly wrought up. They are certainly very charming *as* works of art.

Mr. Mundy's views of New Zealand, of which he contributes a large number, are both interesting and instructive. Executed with great care, their geographical value is incalculable.

Mr. C. Watkins exhibits three portraits of H.R.H. the Prince of Wales in masonic costume; Mr. Wingrave an enlarged view of Coventry Cathedral; and Mr. Mansfield a frame of four figures and some country sketches. All these are executed with care and skill.

There are three large and fine untouched enlargements upon opal glass by Mr. M'Leish, of which *Devotion* (196) is an excellent work. The *Cottages at Glenorchy* (235) and *Winter at Willow Bank* (236) are good examples of the work of Mr. R. Mitchell.

We have already directed attention to some of the larger pictures of Mr. Todd, of Sacramento: it is due to that artist to say that he also excels in small portraiture, some of his *carte* and cabinet productions not being surpassed by any similar works in the Exhibition.

To those desirous of seeing and comparing the special merits of one process with another, Mr. Baynham Jones affords in five charming views by the coffee and albumen process a most favourable opportunity of noticing its capabilities for securing pictorial transcripts of nature.

We cannot close without adverting to the pleasure which many visitors appeared to derive from the inspection of numerous choice and interesting stereoscopic views of American scenery lying on the table, contributed by Messrs. E. and H. T. Anthony and Co., of New York; as well as from a number of transparencies of a similar description exhibited in an elegant series of stereoscopes by Messrs. Murray and Heath.

## NOTES ON DRY-PLATE WORK.

It is curious to look back ten years and note the different estimation in which dry-plate work was held then and is now. Then, it was expected that a dry-plate would show a certain harshness and want of half-tone that would mark it as inferior to a wet plate; now, it is held that as good work is required of the one method as of the other absolutely and in every respect. Anyone who cannot with a dry plate execute work that is fully up to wet-plate work has not mastered the subject. There is even a hope that in the future dry-plate work may give the finer results, for it represents the progressive side of photography. Long inferior, it has advanced until it is now fairly abreast with wet-plate work. What is to prevent it from pushing its way still farther? Wet-plate work, on the other hand, is stationary; it does not seem possible to improve the process. The improvement in the character of wet-plate work that is visible as years pass is due to a higher cultivation of taste and a clearer understanding of the strong and weak points of the method—of what things it can be forced to do well and of what it is useless to attempt.

Some ten years ago I took up the study of dry plates, recording in these columns the opinion that there was no reason why dry plates should not yield results every way equal to wet, and the determination to do all I could towards the attainment of this result. Since then I find, by a recent examination of my note-book, I have given a careful trial to nearly one thousand different processes of my own devising, noting the particulars of each with exactness sufficient to enable me, if desirable, to repeat it without modification. It gives a striking idea of the wide scope of the subject when I say that quite nine-tenths of these processes gave, at least, fair results.

With the earlier forms of dry plates there existed a great difficulty—the tendency shown by all light objects strongly illuminated to thicken up before the shadows could be sufficiently developed. This tendency would show itself in rocks, in sunlight printing white and flat and without modelling; in distances, that printed almost as light as the sky adjoining them; in wooded hillsides, the tops of which looked almost as if snowed upon. Of course such disasters were not confined to dry plates. Wet plates occasionally showed them also; but it required a far greater degree of skill to avoid them with dry plates, and this gave dry-plate work a bad name.

About the time I am speaking of an interesting "moist process" was first brought into prominent notice by Mr. W. H. Harrison. Many persons were delighted with it. I remember that one of your correspondents declared that its results were superior to those of the wet process. A plate could be prepared in the morning, exposed at some time during the day, and developed at night. The process had a very curious defect. With a full exposure everything that was lighted beyond a certain point developed to a transparent red. Thus a rock in sunlight, on a plate that had been exposed sufficiently to give an image of near foliage, would develope to a transparent red all over, looking like ruby glass. It would show no particle of detail, and print perfectly flat. Nevertheless, plates exposed upon easy subjects, such as wide and well-illuminated views, gave good results. In architectural subjects, well lighted and without adjacent foliage, it did extremely well. I have made excellent negatives of such subjects. It seems worth throwing out the suggestion that this process might not improbably be vastly improved by substituting for the honey-glycerine mixture one of albumen, gum water, and glycerine. In this way it is not unlikely that the marked tendency to solarisation might be checked; but at present dry plates may be made of such excellence and with such facility that a "moist" process will attract those only who have an aversion to dry plates, and who wish to keep as near as possible to the wet process.

When, therefore, Sayce and Bolton gave us their emulsion process I perceived in my very first trials with it that it gave a hope of avoiding the thickening up of the lights, which gave so much trouble with the previously-known dry processes. The high lights did not develope so rapidly in proportion to the weak lights, rendering it possible to continue the development until these last showed a sufficient amount of action. I do not know whether this remark has been made before; but it describes, as I think, an essential difference between emulsion work and that made with a bath. Accordingly, from the very first, the emulsion negatives had a different character from all other dry-plate work. The advantage gained was, however, not without corresponding disadvantages, which for a long time rendered emulsion work unpopular with many. Perhaps the most marked of these disadvantages was its extreme uncertainty. No two batches of plates gave the same results. One set would be made, and would give excellent negatives; another day another batch would be made under circumstances supposed to be the same, and every plate would fog or give poor, flat negatives.

At the time I am speaking of the silver nitrate was added in fine powder, and was left to dissolve and react gradually upon the bromides. It was by degrees made out that if the quantity of silver nitrate were small the plates were very deficient in sensibility, that sensibility increased with the dose of silver nitrate, but the danger of fogging also increased. It was finally found that, whenever silver enough dissolved to decompose the whole of the bromides and leave some silver to excess, the plates fogged, but that by adding a mineral acid this could be checked; and that an excess of silver nitrate thus held in check gave entire certainty of immunity from fogging, together with a much higher degree of sensitiveness.

Throughout all these modifications the process retained its characteristic, above mentioned, of controlling contrasts, and even increased it with the improvements. This property has seemed to me so invaluable that almost the whole of my researches have been directed to the improvement of this process; no other seemed to give so excellent a basis. Of these researches a very small part only have been published—that part only that seemed to me to have a general utility; the rest were mere stepping-stones. One conviction these experiments have produced in my mind—that no process which does not involve the presence of free silver nitrate at the time when the so-called preservative is applied can give results equal in sensitiveness or excellence to those of processes in which this characteristic is maintained. I do not express this opinion lightly; for at one time I had a hope that by using the salts in such proportion that there should be a small excess of bromide, or, still better, of chloride, and omitting the *aqua regia*, we might get sensitive plates from an emulsion which would keep better than those in which silver is present in excess. The details of one of these processes in which there is a slight excess of soluble haloids (presumably of chloride, though it is difficult to speak with certainty of the reactions that take place in such a mixture) are given by me at page 123 of your

present volume. It proved, however, far inferior in all respects to those modifications in which silver nitrate is present in excess.

At the present time I find by careful comparison that I have never had such satisfactory results as those obtained by that form of chloriodo-bromide emulsion in which Mr. Bolton's excellent idea of washing the emulsion is included. Whilst adopting, I trust with all proper acknowledgments, that feature, my own system differs from Mr. Bolton's in three important points—in the use of an iodide, in the use of silver nitrate in excess (which Mr. Bolton considered impracticable), and in the application of a preservative to the mass of emulsion when partly dry, and before washing.

There seemed only one point not definitely settled in connection with this form of emulsion—the question how it would keep. It was by some thought that whatever advantage might be conferred by the use of silver nitrate in excess and by the application of a preservative would be accompanied by a deficient keeping power. I did not hold this opinion; for the very thorough washing which the flakes received operated to carry away all sources of danger. I can now say with certainty that this is the case. In April last I prepared some emulsion by the process described in your columns (pp. 172 and 250 of the present volume). On my returning home this autumn I found three or four ounces of residue of emulsion, which had been left in a vial without any other precaution than that of rolling it in yellow paper and placing it in a corner. It had not been placed in a cellar, but had remained exposed during the whole summer season to our great heats in a room with a southern exposure, closed for the summer, and with no ventilation to reduce the temperature—certainly a severe trial. After my return I shook this up, filtered it towards the end of October, and tried seven plates with it. All did well; there was not the slightest deterioration observable. The emulsion was in at least as good a condition, perhaps even better, than when freshly made. Clearly, therefore, there is no danger in preparing it in quantity. I have reserved a portion of this emulsion for future trials at intervals of six months. I see no reason why it should not keep indefinitely. During this perfect quiescence of six months some deposit had taken place; but a very little shaking, perhaps two minutes, brought it into a condition of good suspension again, and the coating of the plates was as easy and as uniform as with emulsion freshly made. It is evident that the presence of silver iodide involves no trouble, nor tends to make the emulsion less manageable. I do not expect ever again to use an emulsion without iodide.

Next week I propose to send you some details as to management and manipulations that I have worked out since my communications of last spring. M. Carey Lea.

## THE DECOMPOSITION OF PYROXYLINE.

The subject of pyroxyline and its reactions, as well as the fitness of different descriptions of it for special purposes, has lately been treated by various writers in these columns, amongst whom may be mentioned the Editors and Mr. Hardwich. It may be considered presumption on my part to attempt to add anything to what has already been written by those who have previously dealt with the subject, but with the permission of the Editors I will say a word or two upon a point which has not yet been dealt with.

It is scarcely necessary to remind even the most inexperienced amongst the readers of The British Journal of Photography that a different description of pyroxyline is necessary for working the various emulsion processes from that in use for wet plates—that, in fact, the success of emulsion workers depends mainly upon the quality of the cotton. I mention the point, however, as my remarks will bear with more force upon emulsion pyroxyline than upon other sorts.

The first difficulty experienced by beginners in emulsion work is that of obtaining sufficient density in the negative. This may, and in all probability does generally, arise, in the case of those who have been accustomed to bromo-iodide plates, from ignorance of the proper mode of development; but it is also certain that it is frequently, especially when excess of silver is used, traceable to the use of an unsuitable cotton. Various remedies have been recommended, and each in its turn has found favour in some quarters. The first of these remedies consisted merely in keeping the collodion for a certain length of time until it had "aged" or ripened sufficiently to produce the desired effect. This, which at one time was considered the only means at command, was obviously in some cases found to be inconvenient, and when it became known that by employing a special cotton the collodion might be used immediately after its manufacture the system of keeping lost favour. In addition, new processes arose which rendered it desirable to form the emulsion in such a manner as to render it impossible to keep the collodion before sensitising; but the difficulty experienced in procuring suitable pyroxyline was so great as to render it necessary to cast about for other means of conferring density.

Those means took the form of additions of various organic substances to the emulsion either before or during the process of sensitising, and were found to answer tolerably well the end in view. Mr. M. Carey Lea, some few months ago, recommended the addition of a small quantity of potassium nitrite to the collodion in order to produce the same result, which was brought about by the formation in the film or emulsion of a slight trace of silver nitrite—a substance which has long been used in the bath for the same purpose. Curiously enough, Mr. Hardwich conceived the same idea many years ago, but worked it out in a different manner, as described in his paper reprinted in these columns (page 487). The latter gentleman's method consists in adding caustic potash, in minute quantities, to the collodion when new, in order to modify it and place it in the same condition in a few hours that it would otherwise have required months to attain.

My view of the *rationale* of this method (which may, however, be incorrect) is that the potash becomes converted into the nitrite by the abstraction of the elements of nitrous acid from the pyroxyline; thus in the one operation securing the presence of the substance which Mr. Lea recommends and, at the same time, reducing the pyroxyline to the state of a lower nitro-compound, or, in other words, to a state in which it is supposed to be better suited for photographic purposes. Furthermore: my impression is that the latter result is brought about by the keeping of the collodion, as I will attempt to show.

Amongst the organic substances which have been recommended and used for this as well as other similar purposes I will mention nitro-glucose. This preparation, which I described fully last year in these pages, is a substance of a kindred formation to pyroxyline, but of a much more changeable and unstable nature. As Dr. Monckhoven showed some time ago, its solution in alcohol, which, when freshly made, gives no precipitate with silver nitrate, will, if kept at a certain temperature (about 100° Fah.) for nine or ten days, give under such circumstances a copious white precipitate, which rapidly darkens by exposure to the light. I also showed, last year, that the same effect is produced more slowly at ordinary temperatures. The change which takes place I have proved to consist of the liberation of nitrous acid, and, consequently, the standard of the substance as a nitro-compound. So great is the decomposition which takes place that a quantity of nitro-glucose in the solid state, which had been preserved in a corked bottle for four months, and which was perfectly neutral to test paper at the commencement of that period, was found to have given off such a quantity of the acid fumes as to completely corrode the cork, having in the process effervesced or frothed up to such an extent as to occupy nearly twice the space it did originally.

Judging from the similarity of composition which exists between nitro-glucose and nitro-cellulose, and bearing in view what is known of the decomposition of the latter, especially when preserved in airtight receptacles, it is only fair to assume that the effect which we call "ripening" is similar in detail to the decomposition of nitroglucose, which, from its less stable nature, produces the result with greater rapidity as well as force. To sum up: I believe the density-giving properties of pyroxyline depend as much upon its power of forming a *nitrite* as upon its organic nature. W. B. Bolton.

## BUILDING AND WARMING STUDIOS.

Having received many inquiries respecting details in connection with my communication upon the above subject, I can do little but reply in a general way, for each studio will have peculiarities requiring special treatment.

Assuming the studio to be a one-story edifice, about eight feet to the eaves, as an approximate estimate of its cost 25s. a yard for the area of the ground it stands upon will be some guide for the cash required to be expended on the whole building. This is assuming that it is plain in appearance and devoid of all extraneous decoration, sign, or ornamental painting. Like all other matters appertaining to building, the quality of the material and workmanship have to be paid for, consequently the cost varies in proportion to the finish. The best work is secured when the timber is cut from the log known as "Baltic." This timber stands the effects of the weather best, and is tougher than that cut out of deals.

A question has been put as to whether or not the ridge of the roof would be better out of the centre of the room. This is another

matter controlled by other conditions. It need not extend beyond the position of the sitter for practical working; but, in the event of being required for groups, it is better that it should possess the capability of transmitting direct light to a greater extent, consequently a blind can cover the upper portion of the skylight. If the studio be narrow the ridge had better be out of the centre, giving most space to the skylight side. If it be say eighteen or twenty feet wide the centre will be best. My experience in building studios confirms the oft-repeated answer to correspondents given in this Journal, that the nearer the skylight is brought to the sitter the quicker the picture can be taken.

Some years ago my peregrinations amongst studios were principally confined to those of New York, where I found that the side light, instead of being perpendicular and at right angles to the floor line, inclined inwards from the top to the extent of a foot or eighteen inches in ten feet. This was naturally the outgrowth of the style of architecture of the buildings generally in the American cities, being what is called "French *renaissance*," which eschews the old English classic form of flat-pitch roof, and invariably finishes in the attic story in the form of a "mansard" roof; that is, rising with the sides inclining about 10° inwards, and the top portion having about the same pitch as our own ordinary slated roofs.

I was, a few weeks ago, conversing with a well-known photographer upon this subject, who mentioned that this form had proved the best for portraiture, and mentioned that the galleries of Mr. Napoleon Sarony and of Mr. Kurtz were both built in this form. To strengthen the opinion I hold upon this matter I may mention that the pictures taken by Mr. Greaves, of Halifax, and which have received such favourable notice in both the photographic journals, were produced in a gallery possessing the peculiarity of the inclined side light; whilst Mr. Greaves himself is quite of the opinion that his success in obtaining fine modelling is somewhat due to the peculiar construction of the studio.

If any photographer contemplate building a studio there is no better way of obtaining reliable information than by consulting some brother artist who has experienced a failure or two in his efforts to do something grand. This is *one* of the benefits arising from membership in a photographic society, where the most enlightened men in the profession are to be found, and who, according to my own experience, are always willing to impart information to their less-skilled brethren.

But the point I would here suggest to the photographer about to erect a studio is that, if the inside or casing between the outside boarding and inside plaster work were filled in with sawdust, it would much add to its warmth. A few sacks of this material can always be easily obtained at some adjacent saw-mill or large joinery establishment. If the floor-joists be laid on the ground, filling in with cinders will prove a preservative against the rotting of the timber and the keen draughts which find their way through the joints of the flooring-boards. But it must be remembered that all timbers imbedded in damp earth are liable to early decay; so the insertion of a few stones or bricks just to keep them clear of the dampness, will be highly beneficial. They need not be built in a continuous wall, but in square piers of about nine inches, and about three or four feet apart. Indeed, to build a studio properly is not an occupation for an amateur; for in every nook and corner the skill of the photographer and also of the building expert must be called into requisition, or the proprietor of the studio may soon see room for improvements which cannot well be applied as after-considerations.

Several letters addressed to me, in response to the invitation I gave for this purpose in my last communication, principally contain questions upon the subject of warming studios, as regards its cost, and as to where the Howarth stove can be procured. I shall reply *seriatim*.

The cost of warming a studio is a good deal like the subject of photographic lenses; but I presume the question points to a building somewhat similar to that carried into effect in connection with Mr. Illingworth's studio, as the communications have come to me through that gentleman. Taking the supply of air from the interior of the room is a very lame mode of attempting to secure pleasant and perfect results. That is one reason, I presume, which led the inventor of the George's calorigen to foresee the great benefit of passing a pipe through the outside wall of the building for the fresh supply; indeed, the idea is a very good one.

The Howarth stove possesses somewhat of a family likeness to the calorigen as far as the principle of the invention is concerned; but the former claims an additional superiority by possessing the power of keeping the bend of the pipes from becoming superheated, and, at the same time, inducing a large influx of fresh air, which, after becoming warmed only, literally fills the room by virtue of the large volume supplied. The Howarth system depends mainly upon the supply of cold air from under the floor of the studio; and I would advise photographers, before adopting any system of warming, to ascertain from either of the two inventors named in this communication whether the situation and plan of the studio are favourable for securing the best results. Any wiseacre may propound a theory on such matters; but an engineer who has given attention to the warming and ventilating of photographic studios and buildings generally might not be particularly struck with the importance of such theory.

I may add that I have not been able to reply privately to the many inquiries I have received, but I have handed the correspondence to Mr. Howarth, 111, Thornton-road, Bradford; but as to the cost, &c., those interested should either consult the advertisement inserted in the advertising pages of this Journal, or correspond direct with the patentee. J. W. Gough.

## NOTES FROM THE NORTH.

If it be true that a bad workman is always quarrelling with his tools, it is no less true that a good workman can do excellent work with the most unpromising appliances. Of this fact I found a capital illustration as far north as the town of Forfar, where I was a few days ago. Forfar is a small town of some eleven thousand inhabitants, very much given to spinning and weaving, and, in consequence, it contains a few wealthy manufacturers and many mill girls and factory hands.

Thanks to all-powerful fashion, gentle and simple alike require to be photographed; and, thanks also to those who have done so much to make the photographic art what it is, the price of a dozen cards, or even of a $12 \times 10$ enlargement, is so small that both classes can readily gratify their tastes. Forfarians who are photographically inclined are fortunate in having in their midst such a photographer as Mr. P. F. Patrick, and judging from the quantity of work I saw in progress he is not going without his reward.

Fortunately for me it happened to be a rather dull forenoon when I found myself at the door with an hour to spare, and so, as is my custom under such circumstances, I went in with the object of setting the hydraulic engine to work. The studio is on a level with the first floor, and measures about twelve by twenty feet. It is of the ordinary ridge-roof description, and from its position admits a good deal more of the bright sunshine than he considers necessary for good work. This, however, he controls by a system of blinds, part of which was quite new to me, and which seems to answer admirably. The roof is furnished with the ordinary roller blinds, but evidently better fitted than in the majority of cases, as they ran very smoothly with a very slight pull. The sides were covered by wooden shutters, each about six feet in length, and reaching from the top to the bottom of the glass. They were hung by pullies on thick iron rods, and could be pushed in any direction with the greatest ease, so that any desired amount of side light could readily be obtained, a few pushes covering every pane of glass on both sides, or any portion of either, as the judgment of the operator might suggest.

That Mr. Patrick knows how to make the best of the appliances at his command was evident from the examination of his work—not of a few specimens only (which when it tells anything at all very often tells something that is——well, not the truth), but of the whole of the previous day's printing. The modelling and general effect was so good that I hinted a strong suspicion of the retoucher's art; but this was strongly repudiated, and the repudiation amply confirmed by an examination of the whole of the negatives, on which there certainly was the impress of the pencil, but only enough to remove a blemish or slightly intensify a high light and relieve a too deep shadow.

I may here say that I saw a very ingenious retouching-stand that was quite new to me, although some of my readers may have seen it. It consisted of three frames measuring about $18 \times 12$, the centre one being hinged to the top and bottom at opposite ends. The middle and upper frames could be raised, and kept at any required angle by laths moving on a screwed nail at one end and slipping into notches at the other. The upper side of the centre frame and the lower side of the upper one were further connected by a cloth bellows, which opened like two fans, and formed a suitable hood to cut off extraneous light. The centre frame was filled with a plate of finely-ground glass, on which the negative was laid, and the light reflected from a mirror let into the lower frame, which lay flat on the table. Altogether the desk was admirably adapted to the end in view; and although the description, in the absence of a sketch, may seem somewhat complicated, the frame may be made by any photographer at the cost of a few shillings.

What, however, pleased me most at Mr. Patrick's establishment was the examination of a considerable number of about $12 \times 10$

enlargements in carbon, and a batch of very fine direct cabinets also printed on the tissue issued by the Autotype Company, and his assurance, with a not unpardonable degree of pride, that he had altogether abandoned silver printing for anything above *carte* size. He confessed that his great success had only been attained after much weary plodding and many disheartening failures, but that he had now no difficulty in generally securing results quite equal to those in course of finishing, and very generously offered to show me the whole method of working whenever I could make it convenient to take another trip to Forfar. This I shall certainly do the first available opportunity, as a man who by steady perseverance has overcome the acknowledged difficulties, so as to produce carbon prints which, when placed side by side with silver prints of the very highest class, are not only equal to them, but really very much better—possessing more brilliancy, greater depth and transparency, and richer in what has been not inaptly termed "juiciness"—must have some "dodges" and "wrinkles" that my readers would like to be made acquainted with. JOHN NICOL, Ph.D.

## AFTER-LIGHTING.*

THERE is yet another point connected with pre- and after-lighting in the camera—that is, with the uncovered lens—which cannot be passed without consideration. I mean it cannot be affirmed that as a rule the number of seconds which the pre- or after-lighting lasts must bear a definite proportion—something like one to four—to the number of seconds' duration of the principal lighting. The reason why I think that no definite rule can be laid down here is because the illumination of the space in front of the lens may be quite independent of the intensity of the illumination of the objects to be photographed; while, as respects the image on the focussing-glass, that is increased by the auxiliary lighting medium, the ground glass, and, above all, by every ray of light in the interior of the camera, which it lays hold of on the spot. Just as an object illuminated by the sun can be photographed from a dark room, so a sun ray may fall upon an objective directed towards some weakly-illuminated object in the neighbourhood. This ray being caught by the ground glass, and transmitted to the picture, the latter would be much more strongly after-lighted than was intended. The contrast so strongly drawn may occur in all the degrees of the scale.

In my opinion, if the pre- and after-lighting method in question ever come into use, it is only by comparing from time to time the effects yielded upon the focussing-glass by holding the ground glass in front of the objective that a sort of scale will be obtained, since even within the small plane of our studios, at the different hours of the day, and with such variable points of distance, not unimportant differences might result. In cases where there was a question not only of quick working, but of the earliest certainty about the result, I have found the flame of a candle placed at a distance of from one to two metres, shining directly upon the plate, a very suitable auxiliary light, as it allows of its effect being easily estimated, it involves very little trouble in using it, and its action can be relied upon. The colour of the candlelight inclines to orange—a shade which is a combination of red and yellow. This colour of the artificial light may be distinctly recognised if, returning from a ball through the dark streets on a winter morning just as day begins to break, one suddenly look up at a window still lighted from the interior. At the first glance it seems as if the window were covered by an orange-coloured blind. Although such flames transmit actinic rays, yet, at the distance mentioned above, they have scarcely any perceptible influence upon the parts not previously affected by the light, while they greatly increase the transformation of those places already excited by the light.

The correctness of this statement may easily be proved if one after-lights in this way half (the other half being covered up) of an under-exposed *carte-de-visite* plate, the edges of which, when in the camera, were protected from the light. If the second lighting have not been too prolonged—say some ten to twenty seconds—according to the size and brilliancy of the flame and the distance between it and the plate, after developing the edges will still appear clear and without perceptible reduction of the silver; the after-lighted part, on the contrary, will show great distinctness of detail, especially in the shadows, where in the covered part it could only be seen indistinctly or not at all. This method of after-lighting makes it possible for me—"*Honi soit qui mal y pense*"—to shorten the exposure by a half. Indeed, one can venture even further if one is prepared to intensify and to overlook a slight tendency to fog.

At two o'clock on a day in October I succeeded in taking on an 11 × 13 plate a group of eight persons—father, mother, and six children—the youngest a child in arms, and the eldest a boy whose risible muscles were continually in play, with a Steinheil's aplanatic lens, in from six to seven seconds with eighteen seconds' after-lighting (I could not see my watch, but the illumination lasted as long as with a single inspiration I imitated the twittering of a bird). The picture was thoroughly good and secured the approbation of the sitters; but truth obliges me to add that it did not escape without a slight fogging.

Yet it is pleasant to be able to say that these fogs, in contrast to their cousins of the silver bath—iron fogs, &c.—do not destroy the detail of the shadows, but allow them to survive even in the deepest depths. That in such cases intensification is specially called for has already been mentioned. It is and will be a characteristic common to all after-lighted pictures that they appear less powerful than those lighted at once in the usual manner. Those in which the after-lighting is proportionately longer show this defect in an extraordinary degree. The actinism of the after-lighting, which appears to act most particularly by bringing out the details in the shadows, really acts equally upon the whole surface of the plate—a circumstance which gives us on the one hand the welcome advantage of graduated shadows, but, on the other hand, as the consequence of very prolonged after-lighting, the flatness of the picture is not modified. The supposition that every ray of light, even the weakest, makes an impression at the moment of contact, though the physical condition of the collodion film, in so far as the combination of the developing agents is concerned, is not far enough advanced to show the picture resulting from that impression, is established as a fact by the way in which a very weak impression can be made visible by after-lighting. Consequently, one must consider that the substance of what is to us one fully-exposed picture is composed of a number of confluent pictures lying immediately above each other, and produced by a continuous series of impressions, which series we might understand as like lines drawn to a given point. One might almost distinguish the properly-exposed picture from the after-lighted. The former is powerful in the lights and soft in the shadows; while in that brought out artificially by an equally-lighted surface the highest lights are not stronger than the deepest shadows, and the resulting pictures are not so substantial.

In spite of those artists who are precise I hasten to affirm that anyone using a powerful collodion (powerful, not hard), and after lighting a small proportion—say about a third—will scarcely be able to distinguish any difference in the quality of the picture. If the foregoing theory be correct, it may be said with a considerable degree of assurance that, in the endeavour to obtain powerful pictures admitting of much after-lighting, attention should be paid not so much to the after-lighting agents as to discovering some modification of the condition of the materials out of which pictures are developed.

In the course of my further experiments, which aimed at obtaining greater power and definition, I reached the conviction that the less the actinic power of the after-lighting coloured rays the slower was their action, and also the longer they can act without fogging the clearer and more plastic the resulting pictures. This knowledge brings me back to the starting-point of all after-lighting, viz., Becquerel's theory that red and yellow rays are continuating. The smallness of the actinic power of intensly-red and yellow substances upon sensitised plates is well known, and, however bright these colours appear in the human countenance, they are black in the photographic version. I, therefore, experimented with red and yellow-coloured glasses, these offering some security, by combining these peculiarities, that plates not yet lighted might be longer exposed under them to the daylight, and that they would not fog under the developer. If Becquerel's theory, as cited above, hold good, I might reasonably hope to obtain excellent results, as they should preserve the clearness of the shadows, thereby adding to the beauty of their appearance.

The kind of glass I have found fulfilling all these requirements and suppositions is glass flashed with suboxide of copper. This glass, as supplied from the glass works, is of a deep ruby red, and objects looked at through it seem to be blood-red. A little white light easily passes through specimens in which the coloured layer is thin or light. This glass has but one fault—the slowness with which it works. If one attempt short after-lightings with it no result appears obtainable; but, every precaution having been taken against the too rapid drying of the plate, a long after-exposure produces surprising results and allows the principal illumination of the plate to be very short. It is understood that during the whole process all foreign light must be excluded. In order to shut out both light and air I use a wooden holder like a dark slide. The cover fits exactly, and the dark red slide slips into the place of the

* Concluded from page 535.

usual wooden one, and is thickly coated with putty where it comes in contact with the wooden edges. This precaution is indispensable, as, with an after-lighting of from fifteen to thirty minutes, a mere pinhole of a flaw would be sufficient to spread a fog over part of the picture—a fog for which the judge might easily be led into making the wholly innocent, though blood-red, glass answerable.

An upright bath, made of such glass and furnished with a velvet-lined cover, might also be used with advantage in order to after-light the plate from several sides, and, consequently, more rapidly. Yet, for plates that have not been all the shorter-lighted, I prefer the dark-slide form as handier, especially in the cold season of the year.

With the help of the red glass I have made instantaneous pictures with ease in the studio. With its assistance it was possible to obtain in a second a picture as clear in the details, though not so powerful, as in ten seconds with the same light and only direct lighting. True, with well-diffused light the after-lighting lasted nearly half-an-hour.

I further made some very promising experiments with the red flames produced by burning strontic nitrate and strontic chloride. As yet I have not succeeded in getting a flame of so pure and beautiful a red as is desirable; but I still cherish the hope that after-lighting with such flames will combine the advantages of the candlelight and the red glass, and that clearness of the picture will be made compatible with short pre- and after-lighting.

It may be remarked that all the experiments enumerated above can be carried out almost as well by pre-lighting as by after-lighting; but the latter *seems* to me to give the most perfect results. Still I cannot affirm with absolute certainty that such is the fact, as my comparisons could not be executed with sufficient exactitude.

After the foregoing there can be no further doubt as to the certainty of the addition of after-lighting to the technicalities of photographic practice. I might even go a step further and maintain that many photographers whose dark rooms are brightly lighted either by candlelight or by a yellow window, really, though unwittingly, employ and profit by after-lighting. I admit willingly that the old way of exposing once for all with the lens directed upon the sitter will remain the rule, and that it will be preferred whenever it can be properly managed; still thousands of cases will occur in which after-lighting will be simply indispensable.

A skilful painter, whose eye catches some momentarily-beautiful movement or expression of his living sitter, seizes the impression, and, in spite of any later restlessness on the part of his model, is able, with the aid of his imagination, to remember, recal, and reproduce it. But we are much more dependent upon our sitter. We often have to regret that the charm of a pose, or of some momentarily-pleasant expression of countenance in the sitter, has been dispelled and cannot be recalled. Photographers will admit that these are niceties which cannot be arranged beforehand; so with heavy hearts we must e'en be resigned, for the sensitiveness of our chemicals is not great enough to catch the passing expression. It is here that after-lighting steps in and enables us to seize and save those precious moments that would otherwise have been lost; and a number of other cases will occur in which one will congratulate himself upon possessing such a helper in time of need. I need only mention the good service it will render to my honoured colleagues with the restless younger branches.

We are, however, scarcely in a position yet to work with very short exposures in the studio; but real instantaneous pictures—such as are formed in the fractional part of a second, and are now only obtainable under unusually favourable circumstances—will not be rareties in future. In like manner good versions may be obtained, by means of after-lighting, of those photographs required for scientific purposes, the procuring of which has, until now, been considered problematical either on account of the short time they can be lighted or the inadequacy of the light-transmitting power of the optical instrument.

Yet more. We shall be able to include dry plates in the circle of these experiments, and the triumph that after-lighting celebrates there will not be its smallest. I would not leave its now undeniable power untried in this department; but certainly the few trials I have until now been able to make are remarkable as not encouraging the most sanguine hopes. We have, however, Victor Angerer's well-known and excellent protracted experiment, in which he exposed some coffee dry plates (by his own account twenty or thirty times less sensitive than wet plates) for ten or twenty seconds in a day in November, in his own studio, with a living model. These plates he afterwards after-lighted for four or six days under two superposed glasses flashed with suboxide of copper, and under the developer he obtained completely-matured pictures, clear and defined even in the deepest shadows, though somewhat thin. The proof of the comprehensiveness of this experiment is that before the developer was poured over them the highest lights were distinguishable, and, as in other sufficiently-lighted plates, on closer inspection the half-tones of the picture were also recognisable.

When after-lighting ceases to be considered a mere pastime it will soon be apparent that not only will the sphere of our work within and without the studio be extended, but that lenses which were laid aside because, though they give a deep and correct image, require a short exposure, will come more and more into use, and will produce excellent pictures both with wet and dry plates. In the case of the latter, success is guaranteed by the special advantages which they possess of allowing unlimited after-lighting without fear of the film drying up, and of observing the maturing of the pictures. All this comes of using the until now little-valued red and yellow light, and, on the other hand, it is to be supposed that the proper tone of colour in the glass or flames employed is of the greatest importance.

Becquerel's opinion must be held to be established in so far as that with no other coloured rays is it possible to produce the developing action under discussion so thoroughly without attacking the clear places; but his verdict must be gainsaid, as red and yellow rays serve also to stimulate, and a plate excited by them can take on the image much more quickly in the subsequent exposure.

We must declare with satisfaction that the after-lighting method appears more glorious after its resurrection than ever it did before. By its means, however, a new blossom has fallen into our lap from that magic tree which we are bound to cherish, and which we call "Photography." JOSEF UNGAR.

## COLOUR AND ITS APPRECIATION.

APPRECIATION or knowledge of colour depends altogether upon individual power of sight. We have certain colours as standards, which, to the great majority of people, present the same appearance. At the same time, two people rarely express the same opinion upon a delicate tint—either from the fact of seeing it differently or being unable to express by words the impression they have received by sight.

We all know that the scale of power of colour appreciation is very extended from those who can detect the slightest admixture of any hue to those who see green as scarlet, or are, in other words, colour-blind; between these two extremes all degrees exist, shading off imperceptibly into each other. I do not think I am wide of the mark if I say not more than one person in fifty has the power of thoroughly appreciating delicate hues.

Another important and rare qualification is the ability to describe colour. A person may, so far as seeing goes, be quite able to discriminate, but utterly at a loss to communicate his impressions to others, as to the quality of tints. There is a string of phrases in common use to assist as far as possible this communication of sensation. The primary colour is taken as the base with a qualification attached, such as greenish-blue, yellowish-green, &c., and for many purposes these are sufficiently accurate. Still, any of these terms would, without other data, be quite useless as instructions to match a fabric; for example, there is an infinite variety of blues and yellows, each producing different shades, at the same time retaining the generic appellation "bluish-green."

The purpose of this paper is, however, to call attention to those colours with which photographers have mostly to deal and are generally adopted by the profession, which, though limited in number, are still sufficiently varied to oftimes be a source of anxiety and trouble to those engaged in their production. Purple, yellow, black, brown, and admixtures of these, are the only colours we need consider; but a proper knowledge of these is an important consideration to all engaged in the production of photographic prints.

I will not presume to give an opinion as to what colour may be best, as tastes vary. A bright picture, whatever the colour may be, is generally pleasing. Browns, since the Adam-Salomon revival, have been in great favour, and will, in all probability, continue to be so. Pure blacks and warm blacks are also equally pleasing; cold tints generally are not so much so. Contrast in this, as in everything else, exerts a powerful influence, pictures in monochrome being peculiarly susceptible of apparent change, according to the light or the colour of their immediate surroundings. To reduce this change to the least possible quantity many adopt wide mounts of special tints, which, by being constantly near the picture, provide a contrast somewhat independent of the place in which it may be hung.

Taking into consideration this difficulty of description I would propose that a standard scale of tints be constructed, each tint being represented by a number, and this standard to be in the hands of all photographers. Then, in lieu of directing proofs to be toned blue, black, brown, or grey—directions conveying different impressions to

each person, and also varying with the light—the number should be indicated, such as "brown No. 2," or "black No. 4," and so on. As there can be no mistake in the comprehension of a figure there would, consequently, be no difference of opinion about the tints—an advantage at once manifest, as it would render those engaged in producing such colours independent of variations of light or of differences of opinion.

If the colour produced corresponded with the number of tint compared with it in the same light every source of misconception would be eliminated, and satisfaction be the only result; whereas, in the present state of verbal directions, as much cannot be said. For instance: the proprietor of an establishment residing in some district where the light is clear and bright, the printing operation being conducted in a smoky town, will decide on the colour he wishes his photographs to be, and give directions accordingly. The toner makes the colour correspond with the directions—with what result? On receipt and examination by the pure white light they are utterly different from what was wished, and not until they are brought back to the vitiated light do they assume the tint ordered in the first instance.

I dare venture to say something of the kind has been the experience of almost all photographers, and that they have been deceived in the colour of a print by examining it under different illuminations. The difficulty of constructing such a scale would be very slight, and our photographic dealers would soon find such a help appreciated by the profession. I will now leave the matter for the consideration of those interested. E. Dunmore.

## FOREIGN NOTES AND NEWS.

Meeting of the Berlin Photographic Society: Herr Richter's Remedy for Blistered Paper; Photographs of the Nicobar Islands; Herr Schaarwächter's Account of His Visit to Paris; M. Maury's Novel Method of Advertising; Carbon Prints and Woodburytypes, &c.—Meeting of the Brussels Section of the Belgian Photographic Association.—Conclusion of MM. Rottier and Waldack's Report.

The Berlin Photographic Society met for the first time after the holidays,—the President, Dr. Vogel, in the chair.

The numerous journals which had arrived during the recess having been laid upon the table, a communication from Herr Richter was read, in which he said that he had discovered a means of entirely doing away with the blisters and spots in albumenised paper. His communication was accompanied by several samples of paper, half of each sample being completely covered with blisters, while the other half, treated with his preparation, was spotless. Herr Richter added that as he had no more paper that showed signs of blistering he would be obliged if any member of the Society would send him some for further experiments.

Herr Richter's letter was listened to with interest, but considerable regret was expressed that he had not specified the means by which the results shown had been attained.

Herr Marowsky said that the samples of paper sent by Herr Richter were certainly very interesting, but that by a simple application of the well-known fact that many papers that blister in a strong fixing bath do not blister in a weak one he could easily produce similar specimens. He would fix half of such a piece of paper in a strong bath and the other half in a weak bath, and thus obtain a piece of paper one half covered with blisters and the other half free from blisters.

The President reported the progress made with the arrangements for the representation of the Society at the Philadelphia Centennial Exhibition. He then placed on the table a number of excellent photographs, landscapes, and groups of the inhabitants of the Nicobar Islands, taken on wet plates by Captain Waterhouse on the occasion of the late expedition for the observation of the eclipse of the sun.

Herr Schaarwächter then supplemented some remarks on the Brussels Exhibition by an account of the studios he visited on the occasion of his journey to Paris *viâ* Brussels. He said that carbon printing had gained ground rapidly in Brussels; that Gerouzet *frères*, for example, turned out daily from 300 to 400 pieces, *cartes-de-visite* as well as other sizes, by this process; that the public were demanding direct carbon pictures, and declined to sit where they could not obtain them. On one of the boulevards at Paris he fell in with an immense show-case belonging to MM. Buguet and Leymerie, which was exclusively filled with "spirit pictures." He considered it highly characteristic of the Parisian public that it should continue to be "taken in" by these spirit photographs after they had been exposed by the police, and their manufacturer punished by imprisonment. However, the vendors of the spirit photographs still drive a thriving trade, and charge from twenty-five to seventy francs a dozen for *cartes-de-visite*, according to the nature of the photographed ghost. He was much interested by the glass stereographs of MM. Lachenal, Favre, et Cie., which are only taken on Sunday forenoons on account of the studio being so much shaken by the street traffic at other times. MM. Lachenal et Cie. also lay great stress upon obtaining a very clear, white glass for their stereographs, and this they can only obtain of the requisite quality from one glass manufactory.

Herr Schaarwächter pronounced M. Valery and M. Liébert, whose studios are opposite each other, the present leaders of Parisian fashion in matters photographic, but he was inclined to think their productions inferior to those of the best photographers in Berlin. This inferiority, he said, the French themselves admitted, and explained as owing to the impossibility of getting as good retouchers in Paris as in Berlin; but he offered no opinion as to the correctness of this explanation. In the waiting-room of M. Nadar, the aeronaut, who did such good service with the balloon post during the siege of Paris, his attention was attracted by an oil painting of the owner (M. Nadar) in the car of an air balloon. He also visited the studio of the celebrated photographer and sculptor, M. Adam-Salomon, situated at some distance from the city in the neighbourhood of the Bois de Boulogne. There he was struck by the harsh, lemon-yellow, cylindrical background. He said that M. Salomon only takes four photographs in a day; and, as the remarkable effects in his pictures are principally produced in the printing, these newly-taken plates show nothing of it. He further visited the Imprimerie Nationale, where he saw a Woodbury press, employed for the production of copies of old coins, in operation; a photographic warehouse exclusively devoted to the sale of unmounted photographs; and M. Goupil's establishment at Asnières, near Paris. At the latter establishment, he stated, silver prints are now only used for small editions; for larger ones the pictures are multiplied by the Woodburytype or photo-engraving processes. M. Goupil has ten Woodbury presses at work, tended by two workmen, and four steam presses serve for photo-engravings. He added that 20,000 impressions can be drawn from a single copper plate. He observed a singular advertising expedient adopted by the photographer, M. Maury. He has a carriage drawn by four ponies driven by a negro through the streets of Paris. The body of the carriage is completely covered with photographs, and the owner's name and address are very prominent. He next visited the establishment of M. Franck de Villechole, who has distinguished himself in the department of carbon enlargements. These he produces by the method of Messrs. Spencer, Sawyer, Bird and Co., which consists in obtaining an enlarged negative from a fine carbon positive upon glass, previously taken from the original negative. He (Herr Schaarwächter) observed some of these enlarged negatives thirty-four inches long. From these positive pictures were printed upon carbon paper. He then went on to say that he had made the acquaintance of Mr. Sawyer, of the Autotype Company, in London, and had an opportunity of seeing the whole process of printing in carbon, and, after giving some details of the process, he showed a number of enlargements ranging up to forty-four inches done by the Autotype Company.

These enlargements, the subjects of which were landscapes and interiors, were regarded with astonishment by the meeting, and pronounced, on account of the sharpness of their details and the softness and richness of their tone, the best that had ever been laid before the Society.

On the motion of Herr Prümm a written vote of thanks for their interesting display was sent to Messrs. Spencer, Sawyer, Bird and Co.

Herr Schaarwächter then showed a lichtdruck by Messrs. Spencer, Sawyer, Bird and Co., and Dr. Vogel showed a series of lichtdrucks by Strumper and Company, of Hamburg, from negatives of various views in Berlin and the Zoological Gardens; and a series of Woodburytypes printed at Bruckmann's Institute, at Munich. The largest of the latter were about $11 \times 8\frac{1}{4}$ inches. Their subjects are Kreling's celebrated edition of *Faust*, a collection of landscapes and woodland scenes, a series of heads from Leonardo da Vinci's *Last Supper*, and the illustrations by Kaulbach of *Hermann and Dorothea*.

Herr Prümm said he was under the impression that fourteen inches was the largest size of plate that could be successfully printed by the Woodbury process, as with plates of a larger size the pressure of the powerful hydraulic press was no longer equal.

Herr Prümm asked how a negative that had become too intense from over-exposure could be reduced and made transparent enough to be used for enlarging from. In the case of the negative in ques-

tion none of the known methods—neither cyanide of potassium nor diluted nitric acid—had produced the desired reduction.

Dr. Vogel recommended laying it in a solution of one part of iodine and one of iodide of potassium in one hundred parts of water, and then coating it with cyanide of potassium.

Herr Reichard recommended that it should be allowed to lie for a considerable time in a solution of chloride of mercury, and afterwards treated with cyanide of potassium.

Herr Prümm said that chloride of iron might be substituted for chloride of mercury, but that his objection against using any of these means was that one had no control over the degree of reduction induced by them. In this case he wished a reliable and controllable substance, because he did not care to run the risk of losing the negative.

No one present knew any such substance except cyanide of potassium; and with this discussion the proceedings were terminated.

The last number to hand of the *Bulletin* of the Belgian Photographic Association contains the report of the meeting of the Brussels section on the 3rd July last. M. Dechamps exhibited and explained his method of enlarging by means of a petroleum lamp. He stated that formerly he used an ordinary lamp, with which the exposure necessary was about seven minutes; now, however, he employed a powerful circular-wick lamp furnished with reflectors, which reduces the exposure to a few seconds. M. Rommelaere expressed his intention of applying the method to the purposes of micrographic enlargements, for which he thought it would be found very suitable. The latter gentleman exhibited Entrekin's oscillating enameller, and a discussion arose as to the value of the oscillating principle. It was also announced that M. Pittems had complained of a difficulty he had recently experienced in using a small diaphragm. The trouble in question, which is said to be known in England as "spot" (?), is described as consisting in a patch which appears in the centre of the negative, as if that portion had been better lighted than the rest. In the course of the discussion it was stated that Mr. Dallmeyer obviated the defect by altering the position of the diaphragm. M. Rommelaere showed a number of negatives reproduced by the plumbago or "dusting-on" process.

In the same number of the *Bulletin* MM. Rottier and Waldack publish the conclusion of the report presented by them to the Ghent section of the Association upon the subject of iron developing solutions. The portion of the subject treated is the use of ferrous acetate. In this connection it is stated that, when a small quantity of ferrous acetate is added to a developer consisting of ferrous sulphate, a great increase of sensitiveness ensues; but that, though dense, harmonious negatives are produced, they are covered with a veil of fog in most cases. It is further stated that a member of the Association had used a developer composed of sulphate of iron and acetic acid, each five per cent., to which were added some iron nails, and the whole allowed to remain for some hours until a certain quantity of ferrous acetate was formed. The result was a considerable increase in the "activity" of the developer. In order to obtain satisfactory results with the acetate MM. Rottier and Waldack state that the quantity used must be kept within certain limits. If the addition be too small the effect will be unappreciable, while if, on the contrary, it be too great the silver deposit will be formed *in* the developer and not on the surface of the film, the only result being a veiled picture. In concluding their remarks upon this salt the writers say that in some cases it produces remarkable effects, for which reason it is not to be absolutely recommended; and whatever its advantages, under certain circumstances, it is certain that it does not offer the same regularity of action which has rendered the sulphate and ammonio-sulphate so valuable. The whole subject is then summed up under three heads:—1st. Developers act very differently according to the strength; up to a certain point strong developers give greater vigour than feeble ones and require a shorter exposure, the weak solutions giving a finer deposit. 2nd. The presence of an acid in the developer may modify the colour of the image; most of the organic acids give a more or less pronounced black colour by reflected light. 3rd. When other ferrous salts are substituted for the sulphate they do not all act in the same way, the acetate, notably, permitting, under certain circumstances, a considerable reduction in the exposure.

## Our Editorial Table.

Views in Orkney and Shetland.

Aberdeen: G. W. Wilson & Co.

To those who have visited these northern islands the art-treasures here presented, which are snatched from nature through the agency of the ubiquitous camera of Mr. G. W. Wilson, prove a most agreeable *souvenir*, serving as a potent memento of these whilom Norwegian although now Scottish islands. On glancing over Mr. Wilson's views the first thing that strikes one familiar with these distant regions is the sound judgment exercised in selecting not only the subjects to be pictorially represented, but the points from which to best accomplish the purpose. Selecting, for instance, *The Old Man of Hoy*—a huge pillar of rock which juts out into the Atlantic at a short distance from a line of precipices said to be a thousand feet in perpendicular height from the sea—this mammoth monolith is presented in a manner not merely calculated to show its wonderful formation and structural details, but to do so under circumstances replete with pictorial excellence. The difficulty and enormous labour, not to speak of the danger, involved in obtaining such a photograph we know from experience to be very great.

There are numerous scenes and archæological vestiges in the Orkneys which allure the camera of the skilled artist; and Mr. Wilson seems to have been perfectly well acquainted with that fact, judging from his pictures, among which we find views of *Kirkwall*, with its noble cathedral and its two venerable and ruined palaces; views of *Stromness*, of *Birsa Palace*, of the *Dwarfie Stone* made famous by Sir Walter Scott, together with the Druidical *Stones of Stennis*—"Old, even beyond tradition's breath;" the curious chambered barrow, *Maes How*, a mound of nearly forty feet in height, recently opened and found to contain a great number of Runic inscriptions upon the walls of an inside chamber about fifteen feet square; together with other places of great interest.

The neighbouring group of the Shetland islands has been equally fortunate in having Mr. Wilson as their graphic delineator. *Sumburgh Head*, *Lerwick*, the *Holm of Noss*, and *Scalloway* form admirable views of these northern homes, none of the pictures, probably, excelling in interest *Uppersound*, with its curious examples of rustic architecture.

It would be supererogatory to speak of the photographic quality or pictorial merit of these views of the "far north"—the name of Mr. Wilson, when associated with pictures, conveying more than could easily be written respecting these artistic gems.

## Meetings of Societies.

### EDINBURGH PHOTOGRAPHIC SOCIETY.

The annual dinner of this Society took place at the Peacock Hotel, Newhaven, on the evening of Friday last, the 19th inst. Dr. Thompson, the President, occupied the chair, and Dr. Sidey, one of the Vice-Presidents, acted as croupier.

The dinner was served in Mrs. Main's best style, and this is saying a good deal, as there are few things in connection with Edinburgh more enjoyable than a first-class Newhaven fish dinner. We are entitled to speak from experience on this subject, as we have more than once had the honour of being guests of the Society on such occasions; but, if allowed to offer a suggestion, we would say that we think the members might do well to select a season for the festivity when the days are longer, as there is a charm in being able to look over the broad expanse of the Firth of Forth, as commanded from the windows of the Peacock Hotel, which loss is hardly compensated for by the brilliantly-lighted and handsomely-decorated dining-room as seen during the dark evenings.

After full justice had been done to the dinner, and due honour given to the loyal and patriotic toasts,

The President rose to propose the toast of the evening—"The Edinburgh Photographic Society." He said that as there were none but members present any eulogium he might pass upon the Society would seem something like sounding their own praise; and, as blowing one's own trumpet was a somewhat distasteful operation, he should content himself with much less than, under other circumstances, he would have thought it his duty to say. Those who regularly attended the meetings of the Society, and all who read the reports which from time to time appeared in the photographic journals, could not fail to understand that it held a high position amongst the kindred institutions of the country, and would see that it had done, and was still doing, much good work in connection with the photographic art. The Society, he said, was never in a more flourishing condition; but there was still much to be done. He would, therefore, impress upon all present, and through them upon the whole body of the members, the duty of continued action, so that not only the present status of the Society might be maintained, but that, if possible, still greater success should be achieved. This could only be done by each putting his shoulder to the wheel, and acting as if that success depended on himself alone.

The toast was enthusiastically responded to, and was followed by those of "Kindred Institutions Everywhere," "Photographic Literature," "Absent Members," "Former Office-bearers," &c., &c., the

toasts and replies being interspersed with songs and recitations. A rather amusing incident occurred in connection with the toast of "Absent Members," proposed by Mr. Dobbie. Just as he sat down a waiter entered the room and handed a telegram to the President, which on being opened was found to be from Mr. W. Neilson, regretting his inability to be present, and begging to be allowed to reply to the toast.

Mr. W. H. Davies, while speaking to a toast, said it might not be generally known to the members that the Council had been for some days considering the desirability of getting up a photographic exhibition. He was sorry to say that, while all were agreed as to the advantages which would flow from such a pictorial display, they had been reluctantly compelled to abandon the idea for this year; but they had resolved that an effort should be made to open one in December, 1876, on a scale not hitherto attempted in Edinburgh. For this purpose a guarantee fund was absolutely necessary, and he was glad to say that from the first two gentlemen that had been called on a sum of twenty pounds had been subscribed. He knew the members pretty well, and he, from that knowledge, had no doubt that an ample fund would be readily guaranteed. Photographers in every part of the country would be invited to become exhibitors, and he hoped that the members of the Society, both professionals and amateurs, would commence early in the season, determined to show that Edinburgh could hold her own against all comers.

The proceedings were brought to a close with "Auld Lang Syne" at ten o'clock.

# Correspondence.

## HEATING BY GAS.

*To the* Editors.

Gentlemen,—No doubt my brother photographers will have considered the advantages offered by a gas fire, and, like myself, might be misled regarding the cost of maintaining such a luxury.

To prevent expense and annoyance, if possible, I may state that, after having one fitted up on the best and most economical principle, as I think, the cost in gas per day, with only something like half the heat, was about equal to the cost of coal for a week, the consumption of gas for say nine hours, using economy, being about 200 feet.

Probably some readers may be amused at my mentioning a simple device adopted to economise gas and obtain a little heat in those dens with which photographers are familiar, when occasionally the gas is lighted to give what little heat may be obtained from it; but, before carrying out the idea, perhaps it would only be using proper precaution to make inquiry whether or not some of the talented luminaries have not already included it in their mania for patents. However, supposing your gas bracket to have on it the brass triangle for supporting a globe as generally used, take a flower-pot of suitable size for placing thereon in a similar manner to a globe, and cut a piece of brass gauze netting to a circle to drop inside within about an inch and a-half of the bottom of the pot; fill the pot with small pieces of pumice-stone, place it with the burner through the hole in the bottom of the pot, taking care to light on the top, not at the burner. You will then have a blue flame, and a considerable amount of heat from a small consumption of gas by keeping the flame of a blue colour.—I am, yours, &c.,

*Ulverston, November* 20, 1875. S. S. C.

## "THE DISCOVERIES OF MR. M. CAREY LEA."

*To the* Editors.

Gentlemen,—My note on the above subject seems to have very much amused Colonel Stuart Wortley, even if he be correct in telling your readers that it will weigh very little with them. My innocent intention was just to remind them that chloride in the emulsion was the discovery of Mr. M. Carey Lea, and not to excite the ire of the discoverer of the uranium process.

Colonel Wortley certainly condemned Mr. Lea's process on account of the "mineral acid" rotting the film, and quietly took to himself all honour for using *more* than an excess of silver, thereby proving that he had "invented" the addition of two grains of silver—Mr. Lea using fourteen, Colonel Wortley sixteen, grains. The latter has my gratitude for making known this scientific fact.

Mr. W. J. Stillman told Colonel Wortley that it was the nitric acid in the nitrate of uranium that preserved the emulsion; Colonel Wortley only parted with his laurels after a hard fight. The basic salt of uranium has about found its value in the estimation of the leading photographers.

Those who recommended and commended the uranium process should be able to tell us that they succeed with it, and not that they have a greater pet of their own. In my hands uranium plates manufactured by Colonel Wortley himself have proved but indifferent compared with those of my own preparing from Mr. Lea's formulæ.

The Wothlytype Company worked uranium with every facility, and a well-paid Chairman to direct it; and yet——but perhaps the "yet" had better be supplied by the shareholders themselves.

Colonel Wortley takes great credit to himself for many important things in photography; but he will never have many followers whilst his processes deal with such ambiguities. He has discovered—so he says—how a gum preservative can be applied without blistering the film; if so, he is the first I have heard of who has. He was in advance of Mr. Blair with the alkaline gum—*had always used it* since it was recommended by Mr. Hardwich; he soon, however, discovered, "after always using it," that the alkaline gum plates would not keep. Mr. R. Manners Gordon's experiments on this point had to take a second place, owing to being anticipated. Succinate, citrate, fluorate, tannate of silver have yielded splendid results in his hands. Here is a great chance for making a reputation for any one who will demonstrate his success.

The gun-cotton improvement *hinted* at will help the Uranium Dry Plate Co. to sell their plates. A *hint* is a capital thing in a commercial sense, but does not go for much in a scientific one.—I am, yours, &c.,

111, *Thornton-road, Bradford, November* 22, 1875. John Howarth.

# Miscellanea.

Dissolving Views.—We have received from Mr. T. J. Middleton his new catalogue of dissolving view apparatus, containing eighty-six closely-printed pages of the names of the slides and subjects, and also the descriptions of the lanterns and apparatus, sold by him. We shall again refer to this comprehensive catalogue in connection with some observations on magic lanterns which we intend to make in the course of a few weeks.

The Photographers' Benevolent Association.—On Thursday evening, the 18th instant, the Photographic Exhibition was specially opened, when a small charge for admission was made. The sum thus obtained was for the benefit of the Photographers' Benevolent Association, the President and Council of the Photographic Society having kindly granted this permission. A small concession like this, while costing the Society nothing, may prove of much benefit to the Association, and we hope to see this friendly feeling continued next year. A moderate sum was realised—more than could have been expected, in consequence of the short notice given.

The Autotype Manual.—It affords us great pleasure to receive the *fourth* edition of this valuable work, for it plainly demonstrates the fact that carbon printing has now taken firm root, and has a deep hold upon public estimation. By the issue of a new and enlarged edition of this excellent *Manual* Messrs. Spencer, Sawyer, Bird and Co. show that, so far as they are concerned, nothing will be wanting to facilitate to the fullest possible degree the operations of photographers. Every photographer who values his reputation as a careful artist should obtain a copy of this *Manual*, the contents of which have been carefully revised and brought up to the present hour, and embrace all the recent developments made by Sawyer, Lambert, and others in carbon printing. The *Manual* is illustrated by a fine collotypic picture of the Autotype Works.

A Photographic Réunion.—On Thursday evening, the 18th inst., M. Lambert was entertained at dinner by a number of gentlemen interested in photography and kindred arts, at the Alexandra Hotel, Dale-street, Liverpool, previous to which his specimens were examined with much interest, M. Lambert and Mr. Ferranti giving a full description of the working of the various patents and explaining the advantages gained by their use. Mr. John Finnie, head master of the Liverpool School of Art, and well-known beyond the limits of local art circles, said that after inspecting the specimens which had been exhibited that evening he felt bound to acknowledge that their artistic beauty combined with their absolute permanency entitled photography henceforth to be recognised as an art. Mr. C. Ferranti, of Liverpool, occupied the chair, and Mr. Finnie the vice-chair, there being present in addition Messrs. W. Clayton, of Nottingham, J. Laing, of Shrewsbury (licensees of M. Lambert's processes), J. J. Atkinson, the acting French consul, Mr. Pierce, Town Clerk of Bootle, and other friends. A very pleasant evening was spent, the dinner being served in Mr. Eberle's well-known *recherché* style. The Chairman, in proposing M. Lambert's health, referred in enthusiastic terms to the great benefits conferred upon photographers by the carefully-studied processes which formed the subject of M. Lambert's patents.

Farewell Meeting and Presentation.—On Friday last, the 19th instant, the *employés* of Messrs. Spencer, Sawyer, Bird and Co. held a *soirée* at the "Green Man," Ealing Dean, for the purpose of bidding farewell to Mr. Washington Spencer, third son of Mr. J. A. Spencer, until lately in the employ of the firm, prior to his departure to fill an important office in South Africa. Mr. L. Hill presided, and Mr. Wilkinson occupied the vice-chair. The room was crowded, very few of the *employés* of the firm being absent. The early part of the evening was spent in conviviality, after which the proceedings were of a more practical character. The Chairman, in proposing the health of Mr. Washington Spencer, gave expression to the esteem in which that gentleman was held by his fellow *employés*, and which arose from several causes—two of which were that he had been connected with the firm for

a very long time, and during the whole of the period he had manifested the most genial and social deposition towards those who filled minoe offices to that which he had occupied. On behalf of the *employés* thr Chairman wished Mr. Spencer a prosperous future, and concluded by presenting him with a binocular field glass (having a suitable inscription on a silver plate), as a tangible proof of their feelings of regard towards him since he first became connected with the Autotype Works. Mr. Washington Spencer acknowledged the present in suitable and becoming terms. The rest of the evening was spent in singing and toasting, and at eleven o'clock the company separated after having had a most happy meeting.

## EXCHANGE COLUMN.

Wanted, a 12 × 10 Meagher's new folding camera with swing back, in exchange for lime light apparatus and coloured slides.—Address, John Weir, Moffat, N.B.

A Ross's $8\frac{1}{2} \times 6\frac{1}{2}$ new rapid symmetrical will be exchanged for a No. 3 aplanatic doublet, by Steinheil, ten and a-quarter back focus.—Address, Geo. Hadley, 2, Victoria-street West, Lincoln.

A large oil-painting (landscape) in a massive gilt frame, 30 × 36, and whole-plate lens, will be exchanged for anything useful in photography.—Address, D. Mitchell, 56, Artillery-place, Woolwich.

A rolling-press, by Briggs, Leeds, size 18 × 12, and camera suitable for 2B or No 1 triplet, and cash difference, offered for Dallmeyer's 1B or similar lens. The above are in good condition.—Address, James Martin, photographer, Insch, Aberdeen.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

G. C.—Thanks. The numbers required will be forwarded as soon as they have been found.

W. H. Metcalf (Millwaukee, Wisconsin).—The cotton will be sent as directed. Thanks for the stereographs.

B. A. T. H.—A thirty-five grain bath will be found to be a good one for general work; but in cold weather this strength may be slightly increased.

C. Ferranti (Liverpool).—Thanks for the enclosures. We quite agree with the encomiastic terms employed by you towards the Lambertype process.

Dundee.—1 and 2. If you send the documents to our office we will get the whole of the matter adjusted at a cost of two shillings, including all stamps and fees.

Anticipation.—Crush the bromide of potassium and place it in a test tube with two or three drops of water. Apply heat, and it will dissolve. Now add a little alcohol. This is the method usually adopted.

J. K.—The varnish referred to as being used in Paris is prepared by the formula given near the bottom of page 175 of our Almanac; but we prefer that on the same page headed *Negative Retouching Varnish.*

C. R. Brown.—1. Try the effect of adding a smaller proportion of alcohol than that mentioned, increasing it by degrees should you find it necessary.—2. Of the various plans we like No. 2 best. They are all good, however.

E. W. Andrews.—This correspondent informs us that the portrait of Mr. Paul Turner (No. 180), at the recent Exhibition, was by inadvertence exhibited as the work of another than our correspondent himself, who is, accordingly, entitled to such credit as is attached to that picture.

Symmetrical (Jedburgh).—Owing to the closeness with which the lenses in your combination are mounted towards each other it will be impossible to insert a concave lens between them. To do this you must have a supplementary mount. Concave glasses may be obtained from any dealer in spectacles.

"Dr. Syntax."—1. The ether and alcohol may be easily recovered by distillation. If you are not familiar with this operation you must proceed very cautiously.—2. We have submitted your query to Mr. A. L. Henderson, who says that, even if the bath be working well, the addition of the barytes will probably improve it; at anyrate it will, he says, cause it to keep in good condition for a long period.

H. F. George.—1. Any good non-distorting lens of about seven or eight inches equivalent focus will answer. In choosing a lens for your purpose select one, by preference, from the class generally specified as wide-angle lenses.—2. You, as a country visitor, have the privilege of attending the meetings of the society when you are in London without being under the necessity of becoming a member.

Captain Abney's Pictures at the Recent Exhibition.—Having received several letters from correspondents desirous of knowing by what process the exquisite pictures of Captain Abney exhibited at the late Exhibition were taken we applied to that gentleman for information. In reply he says:—"I have always looked on an exhibition as something to show result of art, and not merely processes; hence I did not label our pictures either wet or dry. The large pictures are all, except two, by the wet process; the smaller ones I can hardly say myself, as in Egypt I worked with both frequently on the same day, and the negatives are to my eyes not distinguishable one from the other. The *Cataract*, I know, was by the wet process, as also the cloud negative used for the *Colossi* at Thebes; the others I cannot answer for one way or the other. The dry process I used in Egypt was exclusively the albumen-beer process, without precipitating the chloride from the beer."——On behalf of several correspondents we thank Captain Abney for the information here given.

Fix.—1. Of the various formulæ for toning that have been published we think that which is marked No. 1 at page 172 of our Almanac will best answer your purpose. Try it, and write again.—2. Freshly-made starch paste.

R. J. P. (Croydon).—We are totally unacquainted with Colonel Wortley's method of using glycocine in the developer, and we are not aware that he has any intention of publishing it in the paper he has promised to read before the London Photographic Society.



## LONDON GAZETTE, *Tuesday, November* 23, 1875.

Partnership Dissolved.

Vandyke and Brown, Liverpool, photographers.

## METEOROLOGICAL REPORT,

*For two Weeks ending November* 24, 1875.

Observations taken at 406, Strand, by J. H. Steward, Optician.

These Observations are Taken at 8.30 a.m.

| Nov. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks. |
|---|---|---|---|---|---|---|---|
| 11 | 28·98 | NW | 43 | 44 | 47 | 40 | Raining |
| 12 | 29·82 | NW | 40 | 42 | 51 | 39 | Dull |
| 13 | 29·76 | SE | 44 | 45 | 58 | 41 | Raining |
| 15 | 30·24 | NW | 37 | 39 | 49 | 36 | Foggy |
| 16 | 30·12 | SW | 42 | 45 | 53 | 38 | Foggy |
| 17 | 30·05 | W | 44 | 45 | — | 43 | Dull |
| 19 | 29·69 | W | 53 | 55 | 57 | 52 | Hazy |
| 20 | 30·03 | NW | 35 | 39 | 41 | 37 | Cloudy |
| 22 | 30·17 | NE | 36 | 39 | 44 | 35 | Dull |
| 23 | 30·20 | NE | 38 | 40 | 45 | 37 | Dull |
| 24 | 30·22 | NE | 38 | 40 | — | 39 | Cloudy |

CONTENTS.

THE BRITISH

# JOURNAL OF PHOTOGRAPHY.

No. 813. Vol. XXII.—DECEMBER 3, 1875.

## ON MOUNTING.

An examination of the portfolios of the average run of amateurs frequently reveals the fact that, after all due care and the exercise of much taste and technical skill in the making of the negatives and in the production of prints therefrom, the beauty and permanence of the result is sadly marred, not only by carelessness in the mounting, but also by the adoption of unsuitable *matériel.* It is possible that this observation applies more particularly to prints which have been mounted for some time, as we are inclined to think that there has been a gradual improvement taking place, both in the selection of a tint more suitable for the photograph than the ordinary white board, and also in the *matériel* with which the two are united, especially in the free excision of undue quantities of foreground or faulty edges of the picture. But, notwithstanding this satisfactory improvement, there are still a sufficient number of otherwise good prints spoiled to warrant us in an attempt to bring about a better state of things. If any interested reader take the trouble of looking through our volumes for the last few years he will find that the subject has not been neglected; but we believe that, by bringing the various methods together in a collected form and pointing out the relative advantages and disadvantages of each, a more lasting impression may be made on those in whose interests we write.

And, first, as to the proper trimming of the print. We presume that this is universally done before toning and fixing—not merely because it is much more easily done while the print is flat from the printing-frame, but also because the trimmings are rich in easily-recovered silver, and will amply repay the slight trouble involved in collecting and reducing the waste. In the case of *cartes de visite* we suppose the glass trimmer is in genernl use; and, as they are intended to be all of one size, there is no difficulty with them. With prints of larger size, however, this is not the case. They, too, should be trimmed with a glass two sides of which are perfectly square. We say glass, because it admits of the print being seen and a proper judgment exercised as to the exact amount that should be cut off. To do this requires some little care—more, indeed, than is given to it in numerous instances. Amateurs, in too many cases, would seem to regard size with more favour than picturesque or pictorial effect, and cannot make up their minds to part with any portion of a print except the narrowest possible edge; but if those who have a failing in this direction will just take a few of their pictures at random, and with a piece of paper cover up portions of the foreground, sky, or sometimes the sides, they will at once see how great an improvement would have been effected by a free use of the pruning-knife.

Presuming, then, that the prints have been trimmed, toned, fixed, and washed, and the surface moisture removed by pressure between sheets of blotting-paper, the next question is—What is the best material to use as a mountant?

In the early days of photography ordinary flour paste was largely used; but its tendency to abstract moisture from the atmosphere and its liability to become mouldy very soon led to its being discarded in favour of starch—a substance which has to a large extent maintained its ground up to the present hour. But, although starch possesses many excellent qualities, it has a few drawbacks, which to the amateur, at least, are a source of trouble. It is rapidly decomposed and becomes unfit for use, and so requires to be freshly prepared whenever there are a few prints to be mounted; it also contracts very much on drying, and so causes serious cockling of the boards—a cockling which, although seemingly removed by rolling, nevertheless returns again after the mounted print has lain for a short time exposed to the air.

A better mountant, we think, is now frequently used in the shape of a solution of dextrine. It is quite as easily prepared as starch, is almost as cheap, and with the addition of a very little carbolic or salicylic acid will keep in good condition for months; but, like starch, it contracts considerably on drying, and, therefore, the board is not free from the tendency to cockle. It, too, in common with all such mountants, has the fault of being somewhat difficult to use cleanly. In fact, only a really expert mounter—which frequently the amateur is not—can prevent it exuding from the edges, and slightly soiling the mount, which, if of a delicate tint, cannot be cleaned without leaving a mark.

Of all the mountants that have been proposed probably the best, were it not for one objectionable quality, is the solution of india-rubber recommended so strongly some years ago by Mr. J. V. Robinson. This was a syrupy solution of rubber in benzole. The method of application, as is well known, was to make the prints quite dry, and then brush them and the mounts also with the solution. At any moment after the mountant became quite dry if the two surfaces were simply brought into contact with moderate pressure the adhesion was complete. The rubber which had been spread on the mount beyond the part covered by the print was easily removed by slight friction with a clean rag, and the result was apparently all that could be desired. For the purpose of the amateur nothing could be more perfect; the solution was always ready, and no symptom of cockling ever appeared, even when the prints were mounted on the thin leaves of an ordinary scrap-book. The one objection for which the rubber solution has almost been abandoned was the tendency of the print to leave the mount when exposed to a heated atmosphere—in, say, a shop window. We know that this tendency was very generally experienced, but are not quite sure that it is inherent in the material itself; in fact, we are rather inclined to suppose that it is peculiar to certain kinds of rubber only, accelerated by the use of particular solvents. Any person who has worked much with rubber solutions is aware that there are great differences between various samples of the gum. Some are much more liable to oxidation and insolubility than others, while the designation "benzole" is commercially applied to at least several liquids in some of which no sample of rubber we have ever seen will dissolve. If permitted to judge by our somewhat limited experience we should say that prints mounted with solution made from suitable rubber, dissolved in an appropriate solvent, will remain as long and as firmly attached to their mounts as they will do with any other mountant. While we write we have before us an album containing fifty 9 × 11 prints, and a portfolio containing over a hundred of various sizes, all of which were mounted with rubber, and not one of which manifests any tendency to come off. The portfolio has not been much exposed, but the album has been in India, where it lay open to the inspection

of visitors for nearly three years. This, of course, has not been our experience in all cases; we have had to complain of many failures with the rubber solution, but not of one in which this particular sample has been used. At the time it was made we experienced much difficulty in getting suitable benzole, or, at least, difficulty in getting the rubber to dissolve; and, having been consulted by a friend who wished to prepare a rather large quantity as economically as possible, we set about ascertaining what kind of solvent was used by rubber manufacturers, feeling certain that they used something much cheaper than benzole, and were ultimately introduced to a firm which supplied the article to one of the largest rubber works in the country. The substance with which we were supplied was said to be a mineral naphtha, which, of course, did not much advance our knowledge on the subject; it was perfectly colourless, somewhat lighter than the benzole we had been using, had a slightly more disagreeable smell, and cost only two shillings per gallon. On dropping into it a shred of rubber it almost immediately began to swell, and was completely dissolved in a few hours. Rubber to the extent of thirty-four grains to the ounce was added to the whole, and in two days, with occasional shaking, it was all dissolved, and had the appearance of a thick and rather brown syrup, but slightly opaque, the opacity entirely disappearing at the end of three or four weeks.

Failing rubber, however, we have a strong partiality for a mountant which is gradually gaining ground, and possessing many good qualities, such as keeping indefinitely, with an entire absence of cockling. It is sold under various names, such as "mounting glue," "patent mounting solution," "London mountant," &c., &c., but it is simply an alcoholic solution of gelatine. Different samples of gelatine vary so much in strength that it is difficult to give precise proportions; but these can easily be determined by one or two experiments, and if the same make be always used the mountant may at all times be prepared with certainty. Our own experiments lead us to prefer the article manufactured by Cox; for, although much more expensive than some of the foreign varieties, it takes up a much larger quantity of spirit, and so in the end is quite as economical. Four ounces of this is placed in a saucepan or porcelain dish sufficiently large to hold a couple of pints and covered with water. When it has soaked for three or four hours the water is poured off, and the swollen gelatine pressed in a cloth, to free it as much as possible from water. It is then put back into the pan or dish, and a pint of methylated spirit is added, and sufficient heat, either over a water bath or Bunsen burner, applied till it is dissolved. It is then poured into wide-mouthed bottles, and, when cold, should form a rather stiff jelly. When about to be used the bottle is placed in a vessel of warm water, and with a brush the fluid solution is applied, as thin as possible, to the moist print. As short a time as practicable must elapse between the application of the solution and the laying down of the print on the mount; but a very moderate amount of practice will enable this to be done neatly and satisfactorily. To the amateur, at least, we can recommend this as being one of the simplest, most convenient, and best methods of mounting, whether on boards or in the pages of an album; and we have little doubt that those who give it a fair trial will in future discard all kinds of paste in use at present.

## SHORTCOMINGS IN CERTAIN DRY PROCESSES.

The beer and albumen process, as worked and described by Captain Abney, appears to have given a great amount of satisfaction to those who have made trial of it. The notes which follow form a record of experiments made by Captain Waterhouse, who is undoubtedly a careful experimentalist. His results differ, however, to such an extent from those obtained by Captain Abney that we give his record with considerable fulness, in order that those who follow in the track may be enabled to "run to earth" the particular point in which *great* sensitiveness in this country becomes *diminished* sensitiveness in India; for it is only by carefully comparing notes that any deviation from success once obtained can be traced to its true source.

The circumstances under which the trials were made are these:—Having received an intimation that his services would be required in superintending the photographic operations, at Roorkee, connected with the observation of the transit of Venus, and as there appeared to be a general opinion in Europe that a dry process would be most suitable for continuous observations lasting over a period of some hours, Captain Waterhouse set about the selection of the process to be used and the gaining of the necessary experience in working it. The sequel we give in his own words from a paper he recently read before the Asiatic Society of Bengal:—

It was understood that the English observers were to use the beer-albumen dry process recommended by Captain Abney, R.E., and therefore my first trials were with it; but, although the instructions given by Captain Abney were carefully carried out, it was found impossible to obtain the exalted sensitiveness claimed for the plates, and, though the pictures obtained had many good qualities, the exposures were so long that I could not but consider the process unsuitable and look for some other by which more sensitive plates could be secured. The beer-albumen process was, however, tried on several different occasions, both in Calcutta and at Roorkee, with different collodions and various samples of beer, but always with the same result.

The cause of the great want of sensitiveness shown by these plates could not be discovered. Captain Abney says that those who have not succeeded with his process have not used a sufficiently porous collodion; but on this occasion several collodions were used, some containing a large proportion of water, but without any noticeable advantage, though other dry plates taken with the same collodions gave much greater sensitiveness.*

It is possible that the beer used was not quite suitable, from containing too large a quantity of chlorides or other substances detrimental to sensitiveness, and that this was probably the case is shown by the fact that a much greater sensitiveness and generally better results were obtained with the mode of working the beer-albumen process recommended by Mr. Davies, of Edinburgh, in which a small quantity of nitrate of silver is added to the beer with the effect of throwing down all the chlorides and much of a glutinous substance; but even this modification did not give quite satisfactory results, and the idea of using the beer-albumen process for the transit plates was given up. Although the process has, no doubt, yielded excellent results in the skilled hands of Captain Abney and others, the uncertain composition of the different liquids known as beer render it undesirable that this substance should be used in the preparation of dry plates which are to serve as a standard for scientific purposes, and from which comparable results are expected. For such purposes more certainty and uniformity will be attained by the use of materials which are likely to be of nearly the same chemical composition in all parts of the world.

As the beer-albumen process was not found to answer attention was turned to other dry processes, and several different methods were tried with varying results. * * * Among the most promising dry processes tried in these preliminary experiments were the gum-gallic, in which the so-called preservative is composed of a solution of gum arabic and gallic acid, and a process in which the preservative was laudanum, either alone, as a dilute solution in water containing from sixteen to four per cent. of laudanum, or mixed with gum arabic or gum tragacanth, in order to keep the pictures free from the stains liable to occur when using the laudanum alone. Excellent results for views were also obtained with a filtered mixture of laudanum and very thin arrowroot water. I was induced to use the laudanum from a statement of Professor Vogel, of Berlin, that plates prepared with morphia were more sensitive to the comparatively non-actinic rays from the outer part of the solar disc; and, though I did not remark any special superiority in this respect, the laudanum plates were found more sensitive than most of the others tried. Plates prepared with a saturated solution of morphia in water also gave good results.

The addition of uranium to the silver bath, with the view of increasing the sensitiveness of wet collodion plates, has been made the subject of experiment and correspondence. Among those who

* I have quite recently tried the beer-albumen process again with samples of collodion yielding good results with other dry processes, but found the plates just as insensitive as they were before. By flowing the films, after washing away the free silver, with a ten-grain solution of pyrogallic acid in beer, then again well washing, and finally flowing the plate with a mixture of glycerine and dilute albumen, plates were obtained giving excellent results with at least ten times more sensitiveness than those prepared by Captain Abney's plan.

have tried this addition is Captain Waterhouse, who reports upon it in the following terms:—

The addition of nitrate of uranium to the nitrate of silver bath used for sensitising the plates, as recommended by Captain Abney, was found advantageous for most of the dry plates, giving increased sensitiveness and other good qualities. As some doubt has lately been thrown on the advantage of the uranium bath it may be as well to state that, in the ordinary wet process with bromo-iodised collodion, I have found that no advantage is gained by the addition of the uranium salt to the nitrate bath, but, on the contrary, there is a great loss of sensitiveness. With dry plates, however, it is different; the gain in sensitiveness is well-marked and the shadows appear cleaner than on plates sensitised in the ordinary bath without the uranium.

In matters involving micrometric measurement it is of the greatest importance that no shrinkage of the collodion film take place. The late Mr. Sutton had a strong conviction that for all purposes in which extreme accuracy of measurement was required the daguerreotype process would have to be employed, there being with this process no possibility of any contraction or expansion. This subject naturally received the most careful attention from those upon whom devolved the arrangement of the photographic department of the various transit expeditions, and among the rest from Captain Waterhouse. He says:—

When it was first proposed to employ photography in observing the transit it was objected that the collodion processes would be unsuitable on account of the shrinkage or contraction the collodion films undergo in drying. De la Rue, in 1861, made some very careful experiments, the result of which was to show that, with proper precautions, the shrinkage was entirely in the thickness of the collodion film. More recently, however, Paschen had found this contraction to amount to not less than $\frac{1}{1856}$ of the length of the plate with albumenised plates, and to $\frac{1}{2128}$ of unalbumenised plates; in one instance it being so much as $\frac{1}{523}$ of the length and $\frac{1}{618}$ of the breadth of the albumenised plate. Rutherfurd, on the other hand, found that if the plates received a preliminary coating of albumen the shrinkage of the wet film in drying did not exceed $\frac{1}{4800}''$ and was, on an average, about five times less. Professor H. Vogel, of Berlin, also made some experiments on the conditions affecting the stability of the collodion film, which proved the value of a substratum as a preventive of contraction of the film, and showed that dry plates were less liable to contraction than wet. Captain Abney and Colonel Stuart Wortley, when experimenting on a dry process to be used for the transit by the English expeditions, also gave this subject their careful consideration, and came to the conclusion that, with proper precautions, the amouunt of shrinkage would be so small as to be negligible. Notwithstanding this concurrence of testimony as to the possibility of disregarding the contraction of the film, I thought it desirable to satisfy myself as to the suitability in this respect of the various dry processes I was trying, and the plates were therefore tested by a method which I afterwards found was somewhat similar to that followed by Dr. De la Rue, and appeared to have the advantage of entirely avoiding any chance of error from parallax caused by want of absolute contact between the test lines and the collodion film. Several glass plates, five inches square, were prepared by drawing on them, with a very fine diamond point, diagonal lines through the corners of the plates. With the intersection of the diagonals as a centre, a circle was described four inches in diameter, so that it might correspond in size with the solar disc on the plates to be taken during the transit. These test plates were then coated with the usual albumen substratum and prepared exactly in the same way as the dry plates under trial. They were exposed to light from the back, so that an impression of the engraved lines was obtained through the film. The plates were then developed in the same way as the other plates, and, when dry, examined under a very powerful micrometer capable of dividing to the $\frac{1}{100000}$ of an inch. To facilitate the examination a piece of the film was cut away across the lines in different parts of the plate, and the course of the uncovered part of the line compared with the covered part. In no case was any perceptible difference found, except when the substratum had been purposely omitted or processes used which gave rise to blistering of the film. The only chance of error I could see in this plan was the sticking of the film to the rough surface of the engraved lines; but in the cases where the film blistered it was found that the blistering was more marked on the lines than elsewhere, and so it would appear that the lines did not exert any particular influence on the free motion of the film. I had not time to go into the subject very thoroughly nor the means of trying other tests.

In the description of the preparatory work and drills at Roorkee Captain Waterhouse gives an interesting account of the coffee process, which, after modifying to suit his purpose, he ultimately adopted. He observes:—

The dry-plate trials were resumed with the advantage of having a suitable instrument to work with. The beer-albumen and other processes that had been found more promising in Calcutta were tried again, but were found not quite satisfactory with the sun; the tea and coffee processes, which I had not tried in Calcutta were better, and I finally adopted a modification of the coffee process recommended by M. Constant, of Lausanne, substituting albumen for gum to avoid the tendency to blistering so common when using gum, and also with the view of lessening photographic irradiation, against which the coffee proved a further protection. These plates were easily prepared, and were found fairly sensitive, easily intensified, perfectly clear, and free from blurring in the shadows.

The glass plates having received a thin coating of albumen as a substratum, were coated with collodion and sensitised by a somewhat prolonged immersion in a forty-grain silver bath, then washed in four changes of distilled water, and finally immersed in a resensitising solution, or so-called preservative, composed of—

| | | |
|---|---|---|
| Dried albumen | 2 | grammes, |
| Sugar | 12 | ,, |
| Coffee infusion made by boiling thirty grammes of coffee in 360 c. c. of water | 300 | cub. cents., |
| Water | 300 | ,, ,, |

and then drained and dried without heat.

Owing to all the dry plates prepared at Roorkee being covered with spots and similar defects, the cause of which could not be ascertained, trials were made to ascertain if the ordinary wet process could not be used instead, and it was eventually found that by using four sensitising baths there was no difficulty in keeping a regular supply of plates every two minutes. On the advantage of this process we again quote Captain Waterhouse:—

Although the use of dry plates was said to possess the great advantage of enabling irradiation to be much diminished by the use of albumen in the resensitiser, and also in reducing the shrinkage of the film to a mininum, as well as great convenience in preparing and developing the plates at leisure free from excitement or hurry, and in facilitating the working of a large number of plates with a small staff of assistants, the substitution of the wet process had many advantages in avoiding the very tedious operations of preparing and developing so large a number of plates, which alone would have taken up about two days before and after the transit, and more particularly in enabling the state of the work to be seen throughout the transit and any necessary alterations to be carried out immediately. The manipulations of the wet process were perfectly familiar to all my assistants, and by a division of labour they were able to carry on the work with ease and without the slightest confusion.

By giving the films a substratum I hoped to avoid any shrinkage of the collodion in drying, and by placing pieces of wet red blotting-paper behind the plates to lessen the tendency to irradiation.

My programme of operations having been drawn up and approved by Colonel Tennant the first rehearsal took place on the 28th November, with tolerable success, and several points were noticed as requiring modification. After further practice a second full rehearsal took place on the 2nd December, and a final one on the 6th, which was very successful, 120 six-inch plates with six Janssens being exposed in the course of the time the transit was calculated to last.

The preparations for the transit itself, such as numbering and cleaning glasses, preparing and testing baths, and examining the minor adjustments of the instruments, were commenced about a week beforehand.

Unfortunately, the weather for a few days before the transit was very cloudy and most unfavourable for trials of chemicals and testing the focal adjustments of the instrument, which caused some trouble and uncertainty.

Although it was determined to adopt the wet process entirely for the transit plates it was considered desirable to have a small supply of dry plates prepared in reserve in case of accidents and to be used, if necessary, at times when the supply of wet plates could not readily be kept up. About a dozen of the six-inch and four of the Janssen plates

were therefore prepared by the coffee-albumen process, already described, using a highly-bromised collodion recommended by Captain Abney for sun pictures, which gave an intense picture with considerable sensitiveness; but owing to the short time between receiving the materials from England and their being used this collodion had scarcely time to ripen properly, and so could not have a fair trial. Captain Abney's formula was—

| | |
|---|---|
| Thomas's bromised collodion | 20 ounces. |
| ,, iodised ,, | 20 ,, |
| Alcohol (s. g., 805) | 6 to 8 ,, |
| Pyroxyline | 300 grains. |
| Water | 120 minims. |

The plates were developed with the strong alkaline developer recommended by Captain Abney.

One of these Janssen plates and four of the six-inches plates were used during the transit, and, with the exception of the spots, were excellent pictures, fairly sharp and dense, free from blurring, and, in some respects, better than many of the wet plates.

Several days before the transit 120 six-inch glasses were selected from those set aside as the best, and were numbered with a diamond in one corner consecutively from 1 to 120. A reserve of about thirty plates was also selected and marked with a cross in one corner. The whole of these plates, as well as a dozen of the best circular Janssen plates, were then carefully cleaned and coated, on the unmarked side, with an albumen substratum, consisting of the white of one egg and about one drachm of ammonia to a wine-bottle of water, in order to prevent any rising of the film and consequent liability to shrinkage. The plates thus numbered and albumenised were arranged in order in five boxes, holding two dozen each, with the marked corners running along the upper left-hand side of the boxes. Each box was then legibly marked with a distinguishing letter and the numbers of the plates contained in it, thus $\frac{A}{1\text{-}24}$. A sixth box containing marked plates was kept in reserve to be used if required, and it was arranged that any plates so used were to be numbered at the time of use with their proper number in order of sequence.

It was also carefully enjoined on the assistants that the utmost care was to be taken to preserve the proper order of sequence of the plates throughout the operations, but that if, by accident, a plate should be left out, or any alteration in sequence occur, the officer in charge should be at once informed of it and duly record it. Should any of the plates originally numbered be broken during any of the operations, or put aside from any other cause, their places were to be filled up from the marked plates, and they were to be numbered in their proper order of sequence.

Arrangements were made for providing four nitrate of silver baths of suitable size for sensitising the six-inch plates, and a larger one for the Janssen plates; besides these, two small baths and one large one were kept ready in reserve in case of one of the other baths getting out of order or becoming temporarily unfit for use. The baths used were new and about forty-five grains to the ounce (10·2 per cent.).

The collodion used was prepared according to a formula given me by Colonel Tennant, as follows:—

| | |
|---|---|
| Cadmium iodide | 1 gramme. |
| Cadmium bromide | 1 ,, |
| Ammonium iodide | 1 ,, |
| Pyroxyline | 4 grammes. |
| Ether | 110 cub. cents. |
| Alcohol | 110 ,, ,, |

This collodion contained a large proportion of pyroxyline and haloid salts, and was selected because it was found to give more density of the film and intensity of image than the ordinary commercial samples. Two pints of it were carefully cleared for use during the transit.

A reserve supply of a mixture of Thomas's and Rouch's was also used for some of the plates. It was arranged that the collodion should only be used once, so that each plate might be coated with fresh collodion, thus preserving the uniformity of the films and keeping the collodion free from impurities.

An ample supply of developer was also prepared by the following formula:—

| | |
|---|---|
| Protosulphate of iron | 55 grammes. |
| Sugar | 55 ,, |
| Glacial acetic acid | 40 cub. cents. |
| Spirits of wine | 30 ,, ,, |
| Water | 1000 ,, ,, |

A solution of cyanide of potassium was used for fixing.

It was considered advisable not to intensify the plates, but to obtain the greatest possible intensity from the first development.

As the plates were developed they were placed in a draining-rack in order as taken and put aside till after the transit.

Summing up the whole matter the author says:—

As regards the process to be adopted for photographing the transit of 1882 much will depend on the results obtained by the different methods used in December last as to whether photography can be advantageously employed, and, if so, which process is most suitable.

As far as my experience goes, the wet process seems less favourable to perfect sharpness and clearness of the image than the dry; but Colonel Tennant tells me he has lately obtained very superior results by using a pyrogallic acid developer with bromo-iodised collodion, in place of the iron development. From experience I have gained in preparing for photographing the recent eclipse I believe that great advantages may be obtained by slightly staining the ordinary wet films with orange or red aniline dyes, or by the use of *moist* plates prepared with bromised or bromo-iodised collodion, afterwards treated with albumen and glycerine, which I have found very simple to prepare and exceedingly free from all tendency to blurring or irradiation. It is probable, however, that before 1882 the usual modes now in vogue for taking negatives will have been quite superseded by the simpler method of using sensitive emulsions, which have only to be poured on to the plates and dried without any further preparation. Great advances have recently been made by Carey Lea, Bolton, and others in obtaining such emulsions capable of giving pictures with the same rapidity as the ordinary wet or dry processes and with a perfect freedom from the irradiation or blurring so detrimental in astronomical photography, besides which the perfect simplicity and ease of the operations are a strong recommendation; and I may, I think, safely predict that, should photography be used for the next transit, the emulsion processes will, if not exclusively, be used very extensively—unless, possibly, the superiority of pictures taken on daguerreotype plates or silvered glass films over those on collodion should be incontestably proved, or some other better process be discovered meanwhile.

Although the photographic operations connected with the observation of a transit of Venus present no great difficulties, and are in some respects easier than photographing the total phase of an eclipse, a great deal of patient, careful work is required beforehand to ascertain the best conditions for working with regard to local circumstances, and this the short time at my disposal on the present occasion scarcely allowed me to have, especially as so much time was spent over the dry process, which might, as the event proved, have been well employed in perfecting the wet. It is, therefore, very desirable that the subject should not be lost sight of between this and the next transit, and that every opportunity should be taken of utilising the experience already gained towards ascertaining the most perfect methods of taking these sun-pictures. It would also be advisable that as many as possible of the observers of the last transit should also take part in the next.

Although the transit of 1882 will not be visible in any part of India, much useful preparatory photographic work might be done concurrently with the daily observations of sun-spots, now that an instrument is available for taking advantage of the comparatively fine weather enjoyed in this country, particularly at the time of year when the weather in Europe is most unfavourable to such observations; and this would not be the least among the many advantages to science to be gained by the establishment of a solar observatory in this country, which has been so earnestly advocated by Colonel Tennant, and, it is to be hoped, will soon be an accomplished fact.

The notes here presented, made by so careful an experimentalist as Captain Waterhouse, cannot fail of proving both suggestive and instructive.

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A FEW months ago we gave a description of M. A. Pokorsky-Joravko's method of producing transparencies and enlargements, as well as copies of inanimate objects, by means of artificial light, in the shape of paraffine or other lamps, employed in a special manner. At the last meeting of the Brussels Section of the Belgian Photographic Association M. Dechamps again brought this matter upon the *tapis* by the exhibition of an enlarging apparatus depending for its illuminating power upon petroleum. In order to show how useful this application may prove to amateurs, who are not generally supposed to be well fitted out with the requirements for enlarging by artificial

light, it is merely necessary to glance at the immense improvement made by M. Dechamps by only slightly altering the conditions under which his experiments had been made. In the words of the report, he used, at first, an ordinary petroleum lamp of small size, with which light the exposure required was seven minutes. By substituting for this primitive lamp a powerful circular-wick one, furnished also with reflectors, the exposure was at once reduced to "a few seconds." Now, in view of the numerous applications of this principle which amateurs might utilise during the winter months, if not deterred by a wholesome dread of enlarging operations which many possess, we think it well to inform our readers that the use of even so apparently feeble a light as the paraffine is not only feasible but is practically and thoroughly useful—more useful to our amateur readers than many probably more powerful means of lighting. For a further description and details of M. Pokorsky-Joravko's method we must refer our readers to the number of this Journal for August 20th in the current volume.

## SOME MANIPULATIONS WITH THE CHLORIODO-BROMIDE WASHED EMULSION PROCESS.

The following remarks on some of the details connected with this process may have an interest to those who devote themselves to emulsion work. They are the result of observations made on it since I described it in this Journal last spring. For the mode of preparing the emulsion it is sufficient to refer to my former communication,* adding, however, one or two remarks.

Those who have given a fair trial to this process have found it possess a very high degree of sensibility—superior, it may be, to any other dry collodion process, but perhaps not quite so high as that which I have attributed to it. This difference may not improbably be explained as follows:—Almost all who have written on the subject of washed emulsions have, I think, advised to allow the emulsion to become too dry before washing. My own practice is to wait only until it will not wet the finger—understanding, of course, that it must reach this condition not merely on the surface but all through. I therefore apply the preservative at an earlier stage than others, and I think this heightens the sensitiveness. My reason for thinking so is as follows:—

Some years ago, while working an emulsion process with a bath it occurred to me that it was worth while to determine by a critical experiment just how far the film should be allowed to set before putting into the washing water. I therefore made two plates, putting one into the water at the earliest possible moment, namely, as soon as the film would not wet the finger; the other was kept fifteen or twenty seconds longer. These two plates were tested against each other, and it was found that the plate soonest washed was about *twice as sensitive* as the other. Now this fact, whilst it has an important bearing on all dry-plate processes (and may explain many inconsistencies encountered as respects sensitiveness), seems also to indicate that the emulsion should be washed just as soon as it will bear water. This has been my practice throughout, and I think that I probably obtain a more sensitive material than those who postpone the washing till later.

Also, I never use glycerine. In the first place, it seems a needless complication, as it is perfectly easy to wash out all the soluble matter from the pellicle; but, besides this, glycerine tends to insensitiveness. Some years ago I made a whole series of experiments on the effect of glycerine on emulsions, and found that it largely diminished their sensitiveness. It seems to me, therefore, unwise to introduce a substance which is of no particular use, and which, if not perfectly removed, must act injuriously.

*Re-emulsifying.*—In re-emulsifying it is best first to soak the pellicle well with ether before adding alcohol; also the directions generally given for washed emulsions are simply to re-emulsify with alcohol and ether. From the very first I felt positive that this would not do—that more pyroxyline was needed. It does by no means follow that an emulsion which gives a good solid film will, after drying, washing, and re-emulsifying, give a similar one. On the contrary, it will most probably show small checks or splits, or little round holes, arising from a want of sufficient solidity. This fault, I believe, is found with some of the manufactured emulsions. Always, from my first publication on the subject, I have recommended to add more pyroxyline. In my first formula I advised to re-emulsify with one-third each of alcohol, ether, and plain collodion. As I like a very strong, solid film, which we can carry through all the stages of the operation without the least fear of accident, I now go still further in the same direction, and use the following formula:—

*Formula for Re-emulsifying.*

| | |
|---|---|
| Dried flakes | 240 grains. |
| Alcohol of 95 per cent. | 6 ounces. |
| Concentrated ether | 6 ,, |
| Pyroxyline | 36 to 48 grains. |

It is impossible to fix with exactness the quantity of pyroxyline nearer than the above, viz., three to four grains to the ounce, because different pyroxylines act differently as to thickening the emulsion; the object is to add as much as will not interfere with the flowing. Some reference must also be had to the size of the plates used, as, of course, a thicker emulsion can be used on small plates than on large. With the pyroxyline which I have in use, and for plates $6\frac{1}{2} \times 8\frac{1}{2}$, I use the largest proportion above given. Since adopting it I have never seen a single instance of a check, split, or hole in the film. Of course the thickness of the emulsion, if too great, can be corrected by adding ether, but it is best not too depend too much on this. If it be found necessary to add more than a very moderate quantity of ether, it will be better thereafter to use a little less pyroxyline. These, however, are matters which a photographer will easily regulate for himself.

Plenty of time should always be given for the re-emulsifying of the dried material; a week is not too much, with frequent and thorough shaking. And it will be well here to allude again to a matter which has a real importance to working with *any* form of the emulsion processes. It is that *no thorough shaking can be given when the bottle is over one-third full.* Nothing has led to more failures and unsatisfactory results in emulsion work than this one apparently trifling matter. When there is a small quantity of liquid at the bottom of a large vial, every shake dashes it violently against the sides and mixes it up thoroughly with any solid matter present. If the quantity of liquid be increased the effectiveness of the shaking is rapidly diminished. With a bottle one-half full the effectiveness is greatly diminished, and if the bottle be nearly full it is no exaggeration to say that no amount of shaking will give a really useful result. If we compare two cases—say one with a bottle one-fourth, and the other three-fourths, full—we shall find that a shaking of half-a-minute will do more for the first than five or even ten minutes will for the second.

The best course to adopt is to re-emulsify a considerable quantity at once, and give it plenty of time. There need be no hesitation in doing this, as the keeping properties of the emulsion are excellent.

*Keeping Properties.*—From the very nature of this emulsion, from its having washed out of it every substance likely to cause deterioration, it could scarcely do otherwise than keep well. In a recent communication I mentioned that some emulsion prepared in April had proved in October to be at least as good as when freshly made. Since then I have re-emulsified some pellicle made at the same time. They showed undiminished sensitiveness and clearness, but also a disposition to small, circular, hazy dots—an appearance which I have not seen with the emulsion. I think it altogether probable that this is an isolated instance; still, as the emulsion keeps perfectly, it seems preferable to emulsify the plates as soon as prepared, and to keep the material rather in the shape of emulsion than of pellicle.

As to subsidence, there is certainly no form of emulsion which keeps better suspended than this. As an example: some emulsion after standing six months received a moderate shaking of less than two minutes; it was then set aside, and after standing a week was filtered and used without again shaking. It proved to be in excellent condition, and gave a dense film and very sensitive plates. I cannot say too distinctly that where the directions I have given are followed *there is no more difficulty in working an emulsion containing silver iodide than one in which it is absent.*

*Filtering the Emulsion.*—Of all the different modes in use filtering through cotton-wool, a small tuft of which is pushed into the neck of the funnel, is that which seems to do best. Of course the filtration will be more or less fast according to the closeness with which the cotton is pushed into the funnel. The right degree of closeness is when the drops follow each other as fast as one can count. If made to go slower than this too much time is lost; if permitted to run in a stream there may be danger of imperfect filtration. Cotton filters as well as sponge, and does not stop up so much. When sponge is used the filtration becomes, presently, slower and slower, and after a time stops. There is much less of this trouble with cotton, and there is the advantage that common cotton-wool of a good clean sort can be used without preparation, whereas sponge needs to be cleaned with acid and then to be perfectly freed from the

* The method of preparing and washing the emulsion will be found fully described at pages 172 and 250 of this year's volume. The remarks of the Editors (page 193) and of Mr. Henry Cooper (pages 220 and 231) may also be advantageously consulted.

acid. It is not necessary to use a collodion filter—an ordinary funnel answers perfectly; but it must, of course, be kept covered with a piece of glass to prevent evaporation. Convenient glass circles can be bought from the dealers in chemical apparatus. When a failure is made in coating it may be worth while to strip off the film, especially if the plate be large, and return it to a stock bottle. Emulsion that has been passed through the operation of washing is felt to be too valuable to waste.

Some further remarks, in conclusion, I postpone until next week.

M. Carey Lea.

## A NEW METHOD OF FINISHING PHOTOGRAPHS.

Methods, patented and unpatented, for effecting some real or fancied improvement in the finish of photographic prints are legion, so that to add to the number may seem unnecessary. Absolute novelty is almost out of the question; still, as the methods already in vogue permit so many changes to be rung upon them, the chance is that the alterations occasionally made will produce something equivalent to new, if not deemed entirely novel. Our old friend the "sarpint" with a new coat of paint is to many as good as a new "sarpint;" so with a few alterations an old process becomes metamorphosed into a new one. Anyway, by adopting the following method an excellent finish may be imparted at a minimum of trouble and expense. I quite expect the ubiquitous "somebody" has done the same thing before; but, with all due deference to that individual, I do not think his notes have been printed. Without further circumlocution the process is as follows:—

In the first place, enamel your print, as enamelling, though not absolutely a *sine quâ non*, is a decided advantage. We will suppose this has been effected, the subject having been printed in an oval. Now let a mask be constructed of eight-sheet cardboard, of sufficient size to entirely cover the enamelled and mounted picture, with margin to spare; glue a piece of sand-paper on one surface, rough side out, and when dry cut out an aperture of the exact dimensions of the oval of the picture to be finished, taking care the edge is accurate and smooth; adjust this paper "die," so to speak, on the face of the enamelled picture, and apply pressure. Passing them through an ordinary rolling-press answers the purpose well. The result is that the parts in contact with the sand-paper surface are roughened or rendered matt, offering a pleasing contrast to the polished surface of the picture, and in this consists the novelty.

Paper lace and various textile and other fabrics can be substituted for sand-paper, or a metal plate could be engraved to produce any desired pattern. Many substances will suggest themselves to the experimentalist, and variety of ornamentation can be easily devised by altering the shape of the mask. For my own part I prefer sand-paper to most other substances. Any degree of fineness of surface may be got by this means, and by slightly shifting the position of the mask and putting through the press after each alteration.

I think that ornamentation when produced by merely altering the texture of the surface is of a much more refined character than when gold or colour is applied for the same purpose. The plan here described has been found thoroughly workable with little trouble and less expense, as one sand-paper mask will impress a great number of surfaces, and its renewal is most easily managed. All I can say to photographers more than this is to advise them to—try it.

Edward Dunmore.

## JOTTINGS FROM MY NOTE BOOK.

### No. II.—The Carbon Process.

In most cases where it is desirable to determine who was the inventor or discoverer of any particular improvement priority of publication is allowed to determine the issue. In what "publication" consists I would respectfully decline to answer, it being a point more suited for a legal disquisition than one having any relation to the present subject.

That A may make a certain improvement and publish the same does not in any way prevent B going through a like process of reasoning necessary to effect such improvement, and arriving at the same result as A, and, provided B has not drawn on the publication of A, he has proved himself equally an inventor. More than once in the world's history men have, by a coincidence, fallen into the same groove of thought, and, being possessed of equal ability, have arrived at similar conclusions. Mr. Blair seems to have done this with Mr. Burnett; and although he (Mr. Blair) was not the first of the two to record in the photographic journals of the time the principle referred to, still he deserves his share of the honour given to the discoverer of so important a law.

That in saying this much I have made a departure from my original intention of avoiding the expression of any opinion I am ready to admit, but I trust and, indeed, am sure the reader will excuse this, inasmuch as I am dealing with the works of one who is numbered with the dead, and who in his lifetime did much, and that ungrudgingly, for our art, yet received marvellously little in return. It will not be amiss to quote the words of Mr. Blair where he first mentions the principle of sunning on one side and developing on the other. They are extracted from a letter bearing the date of January 15, 1859:—

"On thinking over this matter it occurred to me that, to get a good picture with anything like certainty and ease, the process must in some way be *reversed*, and that the carbon must be *lighted* from the other side—that is, on the inside or side next the paper; and the only way to do this was to use *thin* paper, and turn the back of the paper or the white side of it to the negative. I very soon reduced this to experiment, using Canson's thin negative paper; and, to my astonishment, on the first trial, after soaking a while and washing I got a *negative* on the carbon side, while on the other side there was a faint positive impressed on the bichromate that had penetrated to the back of the paper. This puzzled me somewhat at first, but on a little consideration the cause became apparent."

The italics are Blair's, and the difficulty he overcome. As might be expected many ingenious expedients were brought into operation to utilise the principle here laid down. Burnett followed Blair, suggesting the use of transparent supports, such as glass, sheet gelatine, &c.; but Blair stuck to paper, making attempts to render it transparent, such transparency, after printing, being removed. As yet it will be seen that all the efforts to apply this sunning on one side and developing on the other involved *printing through the support.*

Horsley made some improvements about this time (April, 1859) in the colouring materials introduced in the gelatine. Poitevin published a powder process, in which the perchloride of iron and tartaric acid were used, and with this the year 1859 closed.

A period has now been arrived at that may be described as stormy; for, if words were winds and men were ships, such havoc would have been made as to render it ever memorable. Fargier's patent bears the date of April 18, 1861, although details were published before that time—say in December, 1860. The points of novelty therein are well worthy of study. As a process it may be summarised as follows:—Pigmented and bichromatised gelatine is poured upon a "plane surface (such as glass)." Such plane surface, it will be seen, takes the place of the paper support of modern tissue. After exposure he coated the tissue with collodion and proceeded to develope. The collodion film floated away, carrying with it the picture, which was caught upon "a sheet of gelatinised paper or other suitable surface." Fargier also said that a sheet of gelatinised paper could be used in place of the collodion. Had Fargier but *made* his tissue on paper his patent would have included a perfect single transfer process; but he did not, and that made all the difference.

Blair, on the 5th of February, 1861, first mentions such a process, in which a paper tissue and transference to a gelatinised paper support for development was employed.

In April, 1862, Poitevin makes mention of a modification of his perchloride-of-iron process, in which the reverse of the ordinary action of light takes place, such action producing solubility in a previously-insoluble film.

Carbon printing seems to have been galvanised into active life by the patent of Mr. J. W. Swan, which is dated February 29, 1864; that was when the provisional protection was applied for. The substance of this patent is well known, and, therefore, a brief notice of it will suffice. A "gelatinous photographic tissue" was prepared; paper or glass might be used as a support for the tissue to be formed upon; the tissue might be prepared ready sensitised or not, as required; the exposed tissue was mounted temporarily upon paper for development with a solution of india-rubber, or albumen was used when the print was developed upon the paper to which it was to be permanently attached. Many important things are mentioned here; however, I will only draw attention to one that may be overlooked by the general reader, and yet it is one without which, I apprehend, carbon printing would be very little practised. I refer to the separation of the sensitising from the preparation of the tissue. Simple though this be, its influence has been considerable; in fact, it makes all the difference between commercial success and failure.

In calling attention to some improvements—notably those of Messrs. Henderson, Wyld, and Davies—it is but just to say, in reference to these gentlemen, that Swan's patent was not accessible

to the public until some time after the publication of their improvements; to the best of my memory, it was the 27th August, 1864, before Swan's specification could be seen. In May, 1864, Mr. P. Henderson used and described the use of albumenised paper as the permanent support upon which to develope carbon pictures. He mounted his exposed tissue upon damp albumenised paper by simple rubbing down; then coagulated the albumen with alcohol, and developed in the ordinary way. On the 17th June following Mr. F. Eliot suggested the use of Poitevin's process with this modification—a white pigment in the gelatine, and the tissue formed upon black paper. On the 24th of the same month Mr. C. K. Wyld proposed coating paper with pigmented gelatine, drying, *then* sensitising, exposing, attaching to paper with india-rubber or albumen, and then developing. On the 6th of July following Mr. W. H. Davies described a bichromatised tissue, which, after exposure, was mounted with albumen; or, if to be again transferred, the cementing medium was shellac and Venice turpentine in spirits. Although the foregoing is the date of publication Mr. Davies appears to have been under the influence of an unlucky star, otherwise it would have appeared much sooner, and it is worthy of especial notice that he used *soap* in the preparation of his tissue.

Mr. M. Carey Lea now came forward with a powder process something similar to Garnier and Salmon's, and further suggested the use of various coloured powders for different parts of the picture.

In January, 1866, Dr. F. Gottschalk mentions a discovery of his that has exercised a peculiar fascination over me, inasmuch as it is the only *real* carbon process (save and except it be Seely's). The learned Doctor found graphitic acid was sensible to the light, and it is quite possible that in the future this may be developed into a process that will supersede all others so far as photographic printing is concerned.

Blair, still remaining true to his old love, proposed the use of transparent paper, printing through the same with subsequent transference. In this direction he has been most prolific in resources for accomplishing his ends. Swan showed the necessity of rendering such transparent paper non-absorbent to avoid a non-actinic medium between the tissue and the light. The year 1867 closed, as far as regards carbon printing, by Swan describing a method of transference without a press. He brought the picture out of a bath of gelatine in contact with the paper upon which it was to rest.

In the early part of 1868 Mr. M. Carey Lea printed in carbon on and through glass by reflected sunlight.

The present communication may be ended by describing an improvement resulting from an accident:—A certain pupil of Dr. Vogel's, by an omission, found it was not necessary to use an adhesive material to retransfer a developed carbon print. Dr. Vogel applied this discovery to *undeveloped* carbon prints, afterwards developing with equal success, and published the details in the *Philadelphia Photographer*. The importance of the results flowing from this accident are well known; and I have the pleasure before me of resuming my notes with a modification having equally simple principles as its foundation, yet involving great issues. W. E. Batho.

## NOTES ON PASSING EVENTS.

By a Peripatetic Photographer.

While the split sunshade of Canon Beechey will answer well for stopping out a vertical strip of brightness, the first thought that suggests itself is that it would prove ineffective in the case of a horizontal strip. This, however, is dismissed by the consideration that to meet this difficulty all that is necessary is to revolve the sunshade a quarter of a turn, so as to make its component parts lie across the view.

I remember having once heard of a method of local masking which was said to have proved effectual. The artist's residence was adjacent to a foaming cascade which came dashing down in white masses over brown rocks forming the sides of a deep ravine. To reproduce the latter by photography entailed such a duration of exposure as destroyed the former, hence local masking suggested itself. The way in which he accomplished this was primitive, but satisfactory. The camera was constructed of wood, into one side of which the artist cut a hole through which to peep and see the precise position of the image upon the sensitive plate, the aperture, of course, being protected against the ingress of light. This enabled him to manipulate a small opaque card mask attached to a wire, and inserted from below, moving it deftly over the more luminous parts during exposure, thus shielding them from the action of the light. This method was afterwards modified by the dark slide being made with an expansible back covering, so as to permit him, through sight-holes, to watch the image from behind, and thus to manipulate his mask with a greater amount of comfort. But for this contrivance he could never, he assured me, have obtained the excellent pictures he secured.

Now that the Photographic Exhibition is closed it may not be out of place for me to add my testimony to that of others in affirming it to have been a very excellent display. There was nothing very overpowering from its superiority, but again it included nothing that was noticeable for being really bad; and between the two extremes, which this year have approached nearer together than at any previous exhibition, the mean average was higher than before. But, as already suggested, it would prove of great utility if a department devoted to the display of apparatus were added in future exhibitions.

The last remark is immediately suggestive of the Technical Meeting of the South London Photographic Society, which report says was the most numerously-attended meeting of the kind ever held in London. Great credit is due to this little Society for the energetic manner in which it supplies the shortcomings of the "Parent Society," as the elder body is somewhat mistakenly designated.

I observe that the Photographic Society of France is endeavouring to obtain a repeal of the municipal law of Paris by which a photographer is prevented planting his camera in any public place in that city for the purpose of taking a photograph, without first having obtained permission from the Prefect of Police for the district. This is, of course, intended to prevent the traffic being impeded. When in Paris, in September last, I saw an ingenious dodge being resorted to by a photographer who wished to obtain an instantaneous view of a crowded thoroughfare. He pushed forward from a second-story window a small framework of dimensions sufficient to hold his camera, which was directed down the street; and when this was projected at a distance of five or six feet a flap over the lens was suddenly operated upon by means of a string, and an instantaneous exposure made, the framework and camera being then immediately withdrawn into the room. This method is worthy of adoption by those who wish to take street views, but who cannot conveniently command a suitable point of sight.

By way of a text for my next note I transcribe what Professor Stebbing has said in one of his letters:—"The enamel process, which is the best of all, is too expensive for the million. The fatty-ink process requires an extensive plant. The carbon process is too capricious to gain the goodwill of all." These processes I take in the order recorded. The enamel process, whatever it be to the public, need not necessarily be expensive to photographers themselves. The cost of a tablet is only a few pence, the mode of putting upon that tablet a picture in vitrifiable pigment is now known to everyone who will take the trouble to read the current literature of the art, and it has been demonstrated that the burning-in of such a picture can be done with ease and certainty in a gas stove. The plant required for practising a fatty-ink process need not be either extensive or expensive. An Albion press suitable for printing pictures 9 × 7 inches costs less than a first-class *carte* lens, and I am not aware of any other article included in the requisite "plant" that is worthy of being associated with the two qualifying adjectives I have just used. I venture to say that an Albion press, with its roller and inking-slab, does not occupy more space than the printing-frames, the sensitising, fixing, toning, and washing trays and troughs required in silver printing. *Is* the carbon process "capricious?" I question it. I have practised it a good deal, but never in the course of my experience have I known it to behave in such a way as to warrant my charging it with caprice. On the other hand, its singular ease and certainty have been its leading characteristics. Perhaps the mode of practising carbon printing differs in Paris from that in use in this country.

That Archer is dead we all know. But when, or under what circumstances, has Mr. Fox Talbot entered upon that great change that comes to all, in virtue of which "Free Lance" invokes the "shades" of Archer and Talbot, and speaks of them in connection with being *recalled to life* and photography? Without speaking dogmatically, I venture to state that Mr. Talbot still "lives and moves and has his being" among us. Long may he continue to do so!

If Mr. J. T. Taylor fulfil the hope that was expressed at the Technical Meeting of the South London Photographic Society, by introducing the subject of the burnishing of prints and of the respective merits of the systems employed and the machines introduced for carrying into effect these systems, I trust that he will fairly grapple

the main question involved in the matter, which is this—Will a burnisher act in any different or better way, or produce any better surface upon a print, when it is occasionally moved over that print in an oblique direction instead of being moved in a straight manner? When the question comes to be discussed I feel certain that the verdict will be in favour of direct in preference to diagonal burnishing, especially if a demonstration or actual trial of both methods be made before the meeting. *Apropos* of this Society, it seems to manage its affairs in a very singular manner—one man acting as Secretary both for it and for the older Society, others acting as Vice-Presidents on both. The latter being mere honorary positions little need be said beyond expressing wonder at the bad taste displayed by those holding offices in both societies; but in connection with the secretaryship it is more than a matter of taste. A man may serve two masters, but no secretary can efficiently fulfil the duties of serving two local and, in some sense, rival photographic societies; and this opinion has, I learn, been pretty generally expressed by some of the members of the lesser body who think, not unreasonably, that *their* interests must suffer by such bifurcated officialism. But, if so, why do they not request their Secretary to resign his position as an officer of the Photographic Society of Great Britain? I feel assured that he would do so immediately if he imagined that his holding that office was a source of grievance to any member of the southern fraternity.

## TROUBLES OF A DISCOMFORTED PROTOGRAPHER.

Dedicated to our American Cousins.

Our energetic blood relations on the other side of that broad highway, the Atlantic, are seldom found to be so simple as the scion of the black art at Brooklyn who, by demand of a lady young and charming, as reported, essayed no fewer than seventeen times to satisfy the fastidious whims of his fair model. Such unreasonable patrons of our art are, fortunately, seldom met with; but to those who experience such an infliction I hope to point a way out of the dilemma, which by ingenuity can be altered to suit circumstances, avoiding the unpleasantness of litigation, with all its concomitant evils.

In the busy environs of one of the most important cities in the Southern States of America there lives, did live, or ought to have lived, one Mr. Jonathan—a gentleman of much celebrity, and admitted to be one of the best photographers and most profound expectorators of its far-famed notoriety in both arts. His lofty mind scorned the easy method of expectorating usual to more ordinary mortals; and, great in the confidence of his skill, he would invariably select the most remote cuspadore when indulging in its luxury. This being the prominent part of his character and genius, minor matters troubled him but little; and I will venture to say, from my knowledge of the man, that even a young and charming lady could not inveigle him into making seventeen efforts for an impossible ideal having but an existence in the visionary day dream of say sweet seventeen.

And now for the reasons from which I deduce this opinion of Mr. Jonathan being less ambitious in this branch of his art than his brother worker at Brooklyn. One of those scourges to our nationality, a snob, big with an assumed, not a natural, dignity of deportment, visited Mr. Jonathan's rooms, and condescended to sit to him for his portrait, which, in the modesty of his nature, he declared to be not satisfactory. This circumstance was repeated three times with the like unsatisfactory results, and he put in his fourth appearance for another trial.

The American took the proof-cards and examined them, and then turned a quid he had in his mouth. Scientifically he measured the distance to a remote cuspadore, and having, with practised eye, secured his range, with mathematical precision let off the superabundant juice in a well-directed expectoral discharge which lodged in the exact place it was intended for, and in a manner that only an accomplished Southerner can effect; then, with cool indifference, he remarked—

"Stranger, I never go beyond the charmed number for any one; and I reckon the portraits are like you, friend."

"No! they are about the worst ones I ever had taken, and are not the least like me; I would not have any of them at any price."

"Well, friend, that decision of yours settles mine; and as I think the portraits good, and such as no reasonable man could object to, I will not lose a cent by you. Here, Ned," he said, turning to his assistant, "just place these cards right away there amongst our collection of characters; I guess that is the proper place for them." At the same time, quietly taking out his pencil, he wrote in large letters at the bottom of the portrait—"Specimen of a Britisher!!" Continuing to address his assistant in a grave, business style, he added—"Put him in the window along with that nigger specimen of South Carolina!"

"But," said our countryman, in extreme alarm, "I object to your making such use of my portrait."

"I reckon I can't help that, friend; and it can make no difference to you, since, according to your own remark, it is not the least like you. I don't see my way clear to any half measures; the portrait either belongs to you or me."

Our countryman retired from this scene in the American studio *minus* ten dollars—the price charged for one dozen *cartes de visite*—and with a strong conviction in his mind that, if his time were of no value and of no consideration to him, he could not leave evidences of the fact unpaid for and unutilised in the study of our American cousin, Jonathan.

Reader: I might have given you a cleaner manipulator, and our cousins are estimable fellows; but amongst their good qualities they have that of candour, and they will admit that the disagreeable habit I draw attention to is a national defect, and my remarks would not be true to life without its being quoted. D. K. Griffith.

## FOREIGN NOTES AND NEWS.

The Prizes Offered by the Société Industrielle de Rouen.—New Photo-Plastic Patent.—M. Plucker's Pocket Stereograph.—M. Tedrake's Intensifier.—M. Harnecker's Method of Dispensing with the Substratum.—A Photographic Benevolent Society for Belgium.

The *Société Industrielle de Rouen* have issued a programme of the prizes which they propose to distribute in December, 1876. From the circular we have received we extract the following information:—At the general meeting to be held in December, 1876, the Society will distribute various rewards, consisting of twenty-three gold medals (value 300 francs each), nineteen bronze medals, and nine silver medals to the competitors, who in the opinion of the Committee, may be most successful in their treatment of the subjects contained in the programme. In addition to the medals the Committee are authorised to grant a certain sum in money where the importance of the work may merit such a distinction. All papers sent in for competition are to be addressed to the *President de la Société Industrielle de Rouen*, not later than the 1st October, 1876. The successful works to be published, if thought proper, by the Society. The papers are not to be signed, but distinguished by a *nom de plume*, and accompanied by a sealed envelope, bearing upon its exterior the *nom de plume* of the paper, and containing the name, business, and address of the author.

The prizes, which refer chiefly to various applications of the industrial arts, are ranged under five heads, viz.:—Chemical Arts, Mechanical Arts, Commerce and Statistics, Industrial Art, and Public Utility. The only one which *directly* refers to photography is included under the last named but one, for a practical means of industrially applying photo-engraving to the printing of cloth fabrics. Further particulars may be obtained upon application to M. Ch. Besselièvre, *President de la Société Industrielle de Rouen.*

*The Photographisches Archiv* mentions that the Prussian Minister of Commerce has granted a patent for three years to Herr Adolph Hommel, of Hannan, for a new photographic process called "photoplastography."

The same journal mentions that the Bavarian minister of the interior has intrusted the task of reproducing by photography the art-treasures of the national museum, and publishing them as permanent photographic prints, to Herr Obernetter, of Munich.

In the *Bulletin Belge de la Photographie* M. J. F. Plucker writes to correct some erroneous ideas which were enunciated in the correspondence from France of the previous number, in relation to the recently-introduced pocket apparatus which bears the name of "*stereographe*," and which is known as his invention. The remarks of which M. Plucker complains are to the effect that the *stereographe* is useless for the production of stereoscopic pictures, and he proceeds to explain that it is perfectly applicable not only to the purposes of military topographical surveys, for which it was originally designed, but also to the requirements of travellers, engineers, architects, painters, tourists, and, indeed, to any branch of photography. In proof of this he goes on to describe the action not only of his own apparatus, but also of a similar one exhibited before the Photographic Society of France, which elicited the obnoxious remarks. The principle appears to consist in the use of a diaphragm which protects one half of the stereoscopic plate during the exposure of the other to the single lens with which the apparatus is furnished. The necessary alteration in the position of the lens in producing the second impression is obtained by mounting the objective excentrically in a revolving disc upon the camera front in such a manner as to enable the operator to bring it in front of either half of the plate at will. By the use of a "double excentric" the production of a stereoscopic picture is rendered almost as simple as in the case of an ordinary binocular camera, but particulars are not given as to how the effect is produced. This and kindred instruments may be useful on the score of portability, but will scarcely commend themselves on other grounds.

A new (?) intensifier is described by M. T. Tedrake, by means of which it is possible to secure the finest gradations of half-tone as well as the greatest possible density. The colour of the intensified image may be made to vary from a pale to a deep orange yellow suitable for the reproduction of engravings, maps, &c. The negative, after well washing, is treated with a solution of bichloride of mercury for a greater or less time according to the density desired. It is then, after a second washing, treated with a solution consisting of—

| | |
|---|---|
| Water | 3 parts. |
| Sulphuretted hydrogen (in concentrated solution) | 2 „ |
| Nitrate of potash | 1 part. |

If stains should be feared the proportion of water may be increased, but the action is then slower.

For the purpose of dispensing with any preliminary coating, either of india-rubber or albumen, M. Harnecker recommends the addition of castor-oil to the collodion. This addition is made in the proportion of four drops to the pound of collodion.

A photographic benevolent society, under the name of *Mutuelle Photographic Belge*, has been recently formed in Brussels. This Society, which commends itself strongly to the attention of all photographers, whether employers or *employés*, has for its object the granting of relief to members during sickness and the procuring of situations for those who may be out of employment. The Committee consists of MM. Delabarre, President; Monckhoven and J. Dupont, Vice-Presidents; Alf. Gernzet, Treasurer; Ch. Noel and Columbier, Secretaries; Raynaud, Visitor; and Alker, Delegate for Procuring Employment.

## "THE LADIES OF THE PROFESSION."—SKETCHES.

The following sketches from nature are founded upon incidents and episodes occurring to the writer during some years of his professional wanderings. The "better halves" thus commented upon have, I believe, ceased to be. I shall, however, suppress real names, as "a rose by any other name will smell as sweet," and their "worser halves" won't know anything about it; so I will, without further preface, plunge into the subject with

### Sketch No. 1.

"Betsy, have 'e looked at them frames?"

"Get up and look at them yourself, you idle pig! a-lying there till eleven in the morning. Much the bis'ness would get on without me. I'm dragged off my legs with one thing or another."

Such was the fragmentary conversation I overheard on walking into the studio of a brother artist one fine June morning, having succumbed to pressure from without to have my portrait taken. "T. T.'s noted *C. D. V.s*, at one for two shillings and sixpence, and one shilling after," seemed to be about as fair samples of the then state of photography as were within easy reach. We were not so exacting in the days when the *carte-de-visite* mania first began to show itself as we are now. A strong light and plenty of it and a long exposure were the rule, and a decided expression was the result. Anyway, we thought what good-looking pictures we made; and didn't we take good care to let people know we had been photographed! how often we asked our friends if they had seen So-and-so's specimens if we happened to know our blooming countenance figured amongst them! In short, we were tolerably proud of seeing ourselves, however vile the presentment might be; but *nous avons changer tout cela.*

Well, I was saying I paid a visit to this "brother chip" to be "taken," and overheard as above, which Betsy's invisible spouse responded to with a grunt and mumbled malediction, abruptly ended by my rattling a chair to call attention. A rough, unkempt head protruded round the inner doorway, and was quickly withdrawn, the head in question bawling out, "Missus, there's some un in the shop!" "Missus" being thus appealed to made her appearance in an extreme state of *dishabille*—a shawl huddled round her shoulders, her hair in screws, and her fingers busy doing something with a pin. Catching sight of me, a customer in prospective, she evidently shook herself together a bit, and addressed me—"Beg pardin; hope you've not been waiting long." On assuring her I had only just arrived, she replied—"They're very busy in the other studio a-taking of children, but will soon be done. Mr. T. is so very particular he'll spend hours over a child sooner than send bad ones out, and they did give trouble." Unless my ears deceived me a very audible but suppressed chuckle came from the other room—studio, I should say. "If you would not mind waiting a minute or two," she continued, he will soon be ready." Of course I said I would wait, and the lady proprietress disappeared (to assist her spouse with the children in all probability.)

Anyway, I soon heard (the room wall being but thin boards papered over) —"Now, how much longer are you agoing to be? Do get up. Here's a gent. a-waiting as wants a heap!" I heard a long-drawn "Oh!" and another "Oh!" sharp and short, "Missus" having evidently applied some stimulant. She was using a pin when I saw her, she might have used one then; but that is a matter of mere speculation. I could distinguish a deal of bustling about, and shortly the lady again appeared in a much-advanced state of adornment—a bright blue merino dress, expanded and flounced, with a dazzling scarlet bow at the throat, her hair in a long net of chenille, profusely besprinkled with gilt beads, and a considerable display of Mosaic jewellery. The *tout ensemble* was decidedly striking, to speak mildly. There was a shiny look about the face, and her nose positively glistened again (talk about high lights!—there they were to perfection!), as if in the course of her ablutions all the friction had been applied to that organ. There was left a suspiciously-dark boundary line where whiskers would have been had she been a man, and her ears looked innocent of soap. With these restrictions she seemed got up for the day (more than her husband had, I think) and ready for business.

With a smile she inquired the kind of picture I wanted—full length or head and shoulders? "Full length standing," I replied, "card size." Then with a few other inquiries as to whether I would like them coloured by a "hartist" they employed on the premises, and getting her answers, she set to work to polish some plates. Leaving the room a minute or two she came back and said Mr. T. was still engaged with the children (I heard a snore from the other side of the partition and formed my own opinion), so if I did not mind she would take me. Yes, she was quite used to it; the best in the room were some of her doing. I consented to submit to the operation, and was forthwith set upright against a head-rest with my hand on a chair back. Twisted first this way and then that, the creases pulled out of my waistcoat, and my necktie adjusted, between each alteration and adjustment, the lady backed away, fixing me with her eyes, and lolling her head first on one side and then on the other, till at last she came to the conclusion the pose was all right. She then came, and was a considerable time engaged at some hard work behind me with the head-rest, punching me from time to time on the nape of the neck or back of the head with the suddenness of electric shocks; but whatever she was trying at it seemed to beat her.

At last, very red in the face and shining more than ever, she asked—"Would you mind turning that here screw, as my 'wrisses' arn't strong enough." So, to be obliging, I did it for her; but had I known the torture I was to be subjected to I should have hesitated before complying. How I was fitted into that rest, how my hair was caught in the joints, and the bruises and mauling I received, the memory of it haunts me still. I never see one of those instruments but I shudder. She evidently wasn't used to it, whatever she might say; but after a bit I was fixed to her satisfaction, and the plate was prepared and brought out. How long it took to fix me I don't know. I didn't happen to bring an almanac. Anyway it was some time, and I was breathlessly expecting the usual exordium to stand perfectly still and keep my eyes fixed—I was getting into an awful state of nervousness—but instead it was—"Would you, please, mind putting this slide in here? it sticks." I heard her wriggling at the camera for some time before she spoke. "If you won't fix me again I will; I can stand without very well." "If you will take the same pose," she replied. I thereupon joyfully lent her a helping hand, and uncramped myself—that was worth something—before returning to the head-rest. "Now, quite still, and look at that mark!" So I did—at least I thought I did—for hours; I don't know exactly the time. She said it was two minutes, but I didn't believe her, but let her have her own way. After all she managed to pull out the dark slide, and let the light into the plate in doing it. I was informed it was a perfect success. I had not the courage to ask to see the negative so I paid for one, and on approval was to give a further order. "Betsy" looked blank and despondent; she confidently expected an order for a dozen or two at least. I felt like a criminal in not giving her the order; but I knew what it would be, and could not stand it, so with anxious inquiries as to when it would be ready I departed. "Betsy" looked redder than ever, and I have some idea that I heard a yell out of the next room, but wouldn't swear to it. Anyway, the fresh air seemed pleasant, and as I wandered home through shady lanes I thought what a use that wife was to her husband. E. D.

# Meetings of Societies.

## LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The annual meeting of this Association was held on Tuesday, the 30th ult., at the Free Library, William Brown Street,—the President, the Rev. J. D. Riley, in the chair.

The minutes of the previous meeting were read and passed.

The Secretary then read the following—

### ANNUAL REPORT.

In bringing before you the twelfth annual report of this Association I am still able to say there is no falling off in its prosperity. By death and resignations we have lost five old members, but new ones are taking their places, and I do not doubt but that our numbers will steadily increase.

Few papers have been read this session, but the meetings have been well provided with interesting objects and specimens of the different processes, thus supplying plenty of *materiel* for discussion.

Mr. W. Atkins read a paper on *The Keeping Qualities of Pellicle Emulsion*, and Mr. T. Clarke one on *The Beer and Albumen Process*. Mr. Ellerbeck gave an exhibition of chemical experiments with the aid of the sciopticon. A popular lantern exhibition was given, which was largely attended and gave much pleasure to both members and their friends. A special meeting was held at which Mr. Taylor gave a practical demonstration of the working of the autotype process. The gelatine pellicle process and the collodio-bromide pellicle process have been prominently brought before the members during the past year.

The excursions have been to Lymm, Buildwys and Much Wenlock Abbeys, and to Llangollen; but the attendance, owing chiefly to the unfavourable state of the weather, was very small.

The balance in the hands of the Treasurer is satisfactory, being £25 3s. 5d., out of which, however, will have to be taken the cost of the presentation print for the past year.

The members then proceeded to the election of officers for the year 1876. The following were elected:—*President:* Mr. W. Atkins.—*Vice-Presidents:* Rev. H. J. Palmer and A. Tyrer.—*Treasurer:* Alfred Tyrer.—*Hon. Secretary:* Wm. Murray, 58, Dale-street.—*Council:* Rev. J. D. Riley, Thomas Clarke, W. M. Pendlebury, W. B. Roberts, and L. W. Weber take the place of those retiring.

The usual votes of thanks to the retiring officers were carried.

The Rev. R. E. Batty was elected a member of the Association.

A large number of photographs were exhibited, being the year's work of the Rev. H. J. Palmer, the Rev. J. D. Riley, H. Houlgrave, W. H. Kirkby, and others.

Mr. J. H. T. Ellerbeck exhibited some of the flexible negatives taken by Mr. Warnerke's process. He (Mr. Ellerbeck) said that to use the process advantageously necessitated the use of the roller slide. This was expensive, but he had found no difficulty in attaching the tissue to glasses by means of india-rubber solution. These were put into the usual dark slides, and when exposed the films were detached from the glass—which was readily done—and put aside to await development, and other sensitive tissue replaced on the same glasses. By this means half-a-dozen glasses only were required for a lengthy tour, the weight of a large number of tissues being but little extra. He found them as sensitive, if not quicker, than the Liverpool plates.

In reply to a question how he was able to get his gelatine negatives so much denser than formerly,

The Rev H. J. Palmer replied that he used the plan recommended some time back in the journals for intensifying collodio-bromide negatives, viz., by immersing the negative in a solution of two ounces of chloride of copper to ten ounces of water. This caused the picture to disappear, but after well washing and redeveloping with a drachm of solution A to one ounce of solution B the picture could be brought out with any desirable intensity.

A.—One ounce of ammonia to eight ounces of water.

B.—Three grains of pyrogallic acid to one ounce of water.

A trial then took place as to which was the better lantern lamp—the sciopticon or the Turnbull. Mr. Atkins exhibited the sciopticon and Mr. T. Clarke the Turnbull lamp. After a trial in various ways, showing transparencies, and also with and without reflectors and condensers, the verdict was pronounced in favour of the sciopticon.

The Secretary then gave a practical demonstration showing that with the simplest appliances nothing was easier than to prepare transparencies with the autotype issue.

The meeting was afterwards adjourned until the end of January, 1876.

## VIENNA PHOTOGRAPHIC SOCIETY.

This Society recently met for the first time after the recess,—the President, Dr. Hornig, occupying the chair. The proceedings commenced by the reading over of the rules of the Society and the admission of new members.

The President read a letter from Dr. Schimann, in which he asked for a favourable reception of some glass corners for dark slides that accompanied it, and said that he hoped to be able to send some double corners.

Herr Goldmann said he had formerly supplied similar glass corners, though not so cheaply, but that many photographers had pronounced against them—not only because they made the dark slides dearer, but because the corners were easily loosened, as it was difficult to obtain a cement that would withstand the repeated action of the chemicals.

Herr Luckhardt said he had seen corners of a different construction in American dark slides. These corners were dovetailed into the dark slide, so that they were almost kept in position independently of the cementing putty or glue.

Herr Goldmann took four glass corners with him, and promised to have them fitted into a dark slide before the next meeting.

Herr Luckhardt took advantage of this opportunity to renew his praise of the admirable arrangement of the dark slides exhibited in the American section of the Exhibition of 1873.

Two pamphlets sent by M. A. Davanne, who is an honorary member of this Society, were then laid upon the table. The first was a reprint from the French report upon the International Exhibition of Vienna of 1873, and contained special reports upon photography under the headings of "Processes," "Appliances," "Apparatus," and "Products."

The President directed the attention of the members more particularly to that part of the report in which the author discusses the causes that hinder the quicker development of photography.

The other pamphlet was the guide to M. Davanne's lectures on photography at the *École des Ponts et Chaussees.*

The President then laid before the members a number of new specimens of the Aubeldruck process sent by Herren Aubel and Kaiser. He then told them that Herr Fritz Haugk and Dr. Liesegang had sent a pamphlet entitled *The Light Paus Process*, in which the process and the production of the paper is practically and graphically described. He added that this process was gradually becoming naturalised amongst the Viennese draughtsmen and tended to lower their status in no inconsiderable degree.

A number of photolithographs and phototypographs, sent by M. Rodriguez, were then shown. Then came a lead-pencil sharpener, sent by Herr Lachinger, of Linz, consisting of strips of pasteboard, which, like the so-called elastic slates, have a coating of raw oil colour. A specimen of Ulbricht and Kaders' Elisabeth collodion followed. Members were invited to try the collodion.

Some specimens of Herr Nicola Karlen's photographs of the Burgundy tapestry and views of the Glaciers on the Rhone were then circulated amongst the members. The former—a series of eleven pictures—were interesting both from a historical and an artistic point of view; and the latter, taken under great difficulties, were worthy of a place beside the views of the alteration of the Gürben, by the same artist, which were exhibited at the late exhibition at Vienna.

To these succeeded some lichtdrucks sent by M. Carlos Relvas, of Gollega. This distinguished amateur has lately been dipping very successfully into experiments in the lichtdruck department. In order to learn the process better and more quickly he arranged with Herr Jacobi, of Coblenz, to send his son to Portugal for some time.

Herren V. Angerer and C. Haack were then chosen by vote the judges for the Voigtlander prize.

The President gave a short report upon the Brussels Exhibition, in the course of which he said that, owing to some remarks in The British Journal of Photography, he felt called upon to say that the late exhibition at Vienna had a greater number of pictures than its rival at Brussels, and the former, it seemed to him, were quite equal to the latter in quality.

Herr Luckhardt followed with another report upon the Brussels Exhibition, in which he paid special attention to the carbon processes.

The President then showed some specimens of preserved eggs from the establishment of Herren B. von Effner and Co., of Passau, and remarked that both the preparations, which are distinguished as "mechanically-purified albumen" and "chemically-purified albumen," are remarkable for the ease with which they can be dissolved, the beauty of their colour, and their freedom from smell. Those present were invited to try the preparation.

Herr Luckhardt said that he used it as an addition to the retouching colour for positives.

The President then gave an account of visits to the establishments of Madame Veuve Gillot et Fils and M. Thiel, in Paris. and MM. Goupil et Cie., at Asnieres, which the kindness of M. Davanne had enabled him to make. He also called attention to an album full of Gillot's photo- and paniconographic engravings, comprising a reproduction by photo-engraving of a page of a written Bible of the fourteenth century from the *Bibliothèque Mazarin;* a reproduction of two pages of a missal printed at Paris, by Simon Foster, in 1508; a *facsimile* of an engraving the same size as the original, reduced and enlarged; caricatures, white upon black and black upon a white ground; two reduced copies of woodcuts from Doré's *Baron Münchausen;* reproduction of a steel etching of Raphael's *St. Cecilia*, &c., &c. The process, which is principally employed in the production of printing plates in relief by the *maison Gillot*, was invented by M. Gillot *père*, and is well known by the name of "Gillotage" in Paris, where, with more or less important modifications, it is turned to account by other firms. M. Gillot's first patent dates from 1850. As this process is worked at present by Madame Gillot the print produced with fatty inks upon prepared paper is laid, wrong side upwards, upon a previously-prepared zinc plate. Above the prepared paper a sheet of paper saturated with very diluted muriatic acid is laid, and that is covered by a sheet of dry paper before the whole is drawn backwards and forwards several times under the roller of the lithographic press. If unprepared paper be used it should only be passed once under the roller for fear of the paper sticking to the plate or, by repeating the pressure, producing a double impression. Too sharp a pressure broadens the lines. The covering papers are then removed, the paper damped with very diluted acid, and again repeatedly drawn through the press, after which it is wetted with a copious supply of clean water, and can be removed from the plate, to which the impression of the print in fatty inks will adhere and be transferred from the paper. The plate is then well sponged with water and coated with a solution of gum to which a little muriatic acid is added; this coating is allowed to dry in by warming the plate. The acidified solution of gum must be tried upon a strip of zinc, and should scarcely bite the metal per-

ceptibly. The plate should be allowed to remain as long as possible at this stage before the gum is washed off. The plate is then rolled as if one were taking an impression in the usual lithographic manner. For a first colour M. Gillot uses a mixture of common lithographic ink, white wax, colophony, and lithographic varnish. The plate is allowed to dry, and finely-powdered resin is applied to the whole surface by means of a dabber or a muslin bag. The powder adheres to the fatty places, and brings the colour to a proper consistency for protecting the parts which it covers from the action of the sun, the rest of the resin which has lodged between the lines being removed. By another cotton mop or dabber the border and back of the plate are coated with shellac. The plate is then placed in a swing trough, made of gutta-percha and asphalte, in order to be etched. During the whole of the etching process the trough must be constantly kept in motion, so that there may be a continuous flow of the fluid over the plate to remove the salt which is formed by the action of the acid upon the zinc. In Madame Gillot's establishment a number of these troughs are connected, and are all kept in motion by a small vertical steam-engine. From the top of each trough nitric acid is continually dropped from a bottle upon the plate, and the required depth of the etching is regulated by the strength of the acid. The first etching must only be very slight. The plates are then taken out of the troughs, washed, dried, and placed in a slightly-warmed oven, whereupon the resin melts and runs into the depressions made by the etching, so as to protect them from the further action of the acid. The plate is then taken out and cooled, and the process repeated until the required gradations of tone are obtained, the difference being that the second etching must be stronger than the first and the subsequent heating in the oven more intense, so that the resin may become more fluid and spread better over the parts requiring protection. If there be any large white places they must be carefully covered with shellac before the first etching. When the etching is completely finished the plate must be carefully washed—first with potassic lye and afterwards with benzine—to remove all the colour and resin, and then dried. The unetched white parts are removed with a book saw, and the engraved part fastened to a wooden bed. The photographic establishment of MM. Goupil et Cie., which is under the direction of M. Rousselon, is very extensive. There Woodburytypes and photo-engravings are produced alongside of ordinary silver prints. The Woodburytype presses have been improved by M. Rousselon, so that they are now worked by a screw like that of a letter-copying press. He (the President) found the visit to the galvanoplastic workshop particularly interesting. All the work is done by Clamont's thermo-electric columns. A gas flame burns in these, so that if the gas-piping be connected with a good regulator a constant stream will be maintained, and those disturbing influences which might appear if the attendant were careless are completely warded off. In MM. Thiel's establishment the lichtdruck process is principally employed in the reproduction of chalk drawings. They have modified the process in many ways, especially in their endeavour to obtain durable printing plates. One of their expedients, having this object in view, is to have all the gelatine used carefully tested and chloride of zinc added to harden it.

On concluding the above remarks the President showed some photolithographic reproductions, by Herr A. Beszedes, of Dürer's *Passion of Our Lord* and other drawings. The subsequent proceedings were of merely local interest.

# Correspondence.

## "THE DISCOVERIES OF MR. M. CAREY LEA."

*To the* Editors.

Gentlemen,—It is a new thing to be found fault with for making discoveries.

If it be a crime—as from Mr. Howarth's attack on me one would think it was—to have used gum arabic since Mr. Hardwich first proposed it, to have found out how to use a gum preservative without getting blisters, and to have used various salts of silver with success, I cannot help it; but I may remind you that the very worst form of trades'-unionism is the one that attempts to prevent a man from doing better or more work than his fellows, and tries to punish him for so doing.

In respect to Mr. M. Carey Lea, I have had a difference with him on a certain point; but I, in my paper read before the London Photographic Society in June, 1871, gave him the fullest credit for all his work, and I still feel (though I do not use a chloride owing to its disadvantages) that his proposal to use a mineral acid, and which led to to my using nitric acid, was one of the most valuable ever made in connection with emulsion work. It cannot be used with some pyroxylines, but with a *suitable* pyroxyline but little difficulty need be experienced.

Mr. Howarth has not "excited" any "ire" in me. I have never before heard of his name in photography; but I was bound, as I did, to show that, in saying "months afterwards" uranium was found to keep an emulsion, he said what was not true, and that it must have been within his knowledge that it was so. His last letter is full of abuse of me, but in no way controverts this fact.—I am, yours, &c.,

*Rosslyn House, Grove End-road, N. W.,* H. Stuart Wortley.
*November* 29, 1875.

## HEATING BY GAS.—THE LAMBERT PATENTS.

*To the* Editors.

Gentlemen,—I notice in your last issue a letter, signed "S. S. C.," upon the subject of *Heating by Gas,* which is a matter of considerable importance to many photographers. But the extraordinary result as regards cost which was produced in "S. S. C.'s" case by the "most economical principle" is difficult of comprehension unless further details be given as to what constitutes the principle. The plan proposed in the latter part of the letter for producing a great heat with a small expenditure of gas is handy as well as ingenious; but it is questionable if the economy is equal to that of a properly-constructed gas stove. It is also liable to another objection, viz., that in addition to the "great heat" which is produced there will also be a large quantity of noxious gas given off which "S. S. C.'s" plan does not provide for getting rid of—a matter of the very highest importance "in those dens with which photographers are familiar." If "S. S. C." can give the needful explanation he will doubtless confer a favour on a large number of your readers.

Would you, gentlemen, or any of the parties interested in the matter, kindly inform me whether M. Lambert offers the same privilege to amateurs as the Autotype Company do, in the way of permitting the use of his processes on condition that the materials are purchased from him? If not, do the Autotype Company supply the coloured tissue as employed in the contretype process? And, lastly, is there anything in M. Lambert's patent to prevent amateurs reproducing negatives by means of carbon tissue?—I am, yours, &c., Dunham.

*Manchester, December* 1, 1875.

## GLYCOCOLL IN THE DEVELOPER.

*To the* Editors.

Gentlemen,—In your "Answers to Correspondents," last week, you say to "R. J. P. (Croydon)"—"We are totally unacquainted with Colonel Wortley's method of using glycocine in the developer."

I beg to refer you to the communication on this subject which appeared in The British Journal of Photography for August 20th last, page 401. There you will find my formula given in the minutest detail, and the amount added to the thirty-grain iron developer, of course, varies with the age of the collodion, acidity or neutrality of the bath, &c., &c., and I therefore said sufficient to restrain fog. I am surprised to find you "totally unacquainted" with a formula supplied to you at your own request, and printed in your pages three months ago.—I am, yours, &c., H. Stuart Wortley.

*Rosslyn House, Grove End-road, N. W.,*
*November* 30, 1875.

[The Croydon correspondent whose query elicited the "answer" to which reference is made was quite well aware of what Colonel Wortley had written concerning glycocoll, but, like *several* other correspondents of whose complaints we had previously made Colonel Wortley aware, he was desirous of obtaining more definite directions than those given—not concerning the way of preparing the glycocoll, but in the proportions in which it ought to be added to the developer —the words "sufficient of the glycocoll solution and formic acid to restrain fog" not being, as our correspondent observed, sufficiently clear to those who could already develope pictures by the usual iron solution without obtaining fog. The query of "R. J. P." may be assumed to be a representative one, and we here publish an extract from his communication:—"In common with a number of friends of mine I have been waiting expectantly to see some notice taken by Colonel Wortley of the particulars of quantity and directions for use of glycocine in the developer for wet plates as made by him, asked for some time back by a correspondent. Do you know if it be kept back as a secret? Possibly you might use your influence with the Colonel and prevail upon him to give us amateurs, who have no time for experimenting, the clue to the proper use of the new accelerator." Instead of saying, as we did last week, that we are "totally unacquainted with Colonel Wortley's *method* of using glycocine in the developer," it would, probably, have been better had we said that we were totally unacquainted with any details of the method other than were to be found in his article on the subject. As attention has been thus redirected to an addition of this substance to the developer—not as a mere restrainer of *fog,* but as an "accelerator"—we should like to receive a few details of the kind desired by "R. J. P." and his friends. Will Colonel Wortley kindly furnish them?—Eds.]

## EXCHANGE COLUMN.

**I wish to exchange a Dallmeyer's wide-angle landscape lens, ten inches focus, never used, for one of Ross's new rapid symmetricals of six or seven inches focus, or for one of his portable symmetricals, Nos 3, 4, or 5 —Address, X., Elgin House, James-street, Oxford.**

## ANSWERS TO CORRESPONDENTS.

PHOTOGRAPHS REGISTERED.—

W. Harding Warner, Denbigh.—*Three Views (Exterior) of St. Asaph Cathedral.*

Frank W. Micklethwaite, Newry.—*Four Interior Views of Dominican Church, Newry.*

☞ *Correspondents should never write on both sides of the paper.*

R. BROWN.—Received. Accept our congratulations.

A. AND G. TAYLOR.—Received.—Thanks. In our next.

E. DEBENHAM.—Thanks for the beautiful cabinet portrait.

S. ARLIDGE.—Thanks for description and photograph of tent.

THOS. ROSS.—After making a few inquires we shall answer your query privately.

J. BLAIR.—Seven grains of chloride of sodium to each ounce of albumen will be a suitable proportion.

R. H., AMATEUR.—The cause of the paper becoming stained is the imperfect washing to which the print has been subjected after being bleached.

X. Y. Z.—Although heat is not absolutely necessary to evolve the vapours of the hydro-carbon, it will be better to raise the temperature to about 85° Fahr.

F. H. H.—The person to whom you refer left this country three or four years ago; and we regret to have to add that we learn he has turned out very badly.

CANON BEECHEY'S QUINTUPLE SUNSHADE.—We may remind those who have not yet seen this useful adjunct to a lens that it is still at our Publishing Office.

LAWRIE AND MITCHELL.—Yours is not the only letter on the same subject we have received. The matter is one requiring legal investigation. We shall make inquiries.

E. LEE.—There is no reason why negatives of the highest class may not be obtained by means of Mr. Warnerke's pellicle. If required for printing in the solar camera it must be attached to a plate of glass. The heat will not affect it.

G. D.—1. The brown tones can be obtained by treatment with a weak solution of sulphide of ammonium after the application of the bichloride of mercury; but, unless for a temporary purpose, we could not recommend this method.—2. Flashed opal glass will best answer your purpose.

J. K. F.—This correspondent is desirous of ascertaining our reason for stating that a large portrait lens of long focus is not so suitable for a magic-lantern objective as a small quarter-plate lens. The reason is this:—The shorter the focus of the objective the larger is the image depicted upon the screen; and it is not expedient that a great space should intervene between the lantern and the screen.

SARDONYX.—The invention cannot be registered, but must, if protected at all, receive the protection afforded by a patent; but this step we cannot advise, for two reasons—firstly, the demand for the article would be so limited as not to recoup your expenses; secondly, the essential feature in a subject for a patent—novelty—is wanting in this case, articles similar to that which constitutes your invention being regularly sold in several London establishments.

COUNTRY PHOTO.—1. The optician you name has a high reputation.—2. Very few, to our knowledge, use the curtain to which allusion is made.—3. The album in question contains several photographs lighted in various ways, to imitate which it would be necessary for you to have a series of blinds fitted in a certain manner, particulars of which are given in the book.—4. We have never seen the work on painting photographs, hence are unable to speak as to its merits.—5. The spotting must be done before the print is enamelled.

P. S. HART.—Our correspondent inquires if we or any of our readers have ever observed that albatype prints produced by the collodio-chloride process fade. The query of Mr. Hart has induced us to examine carefully a lovely print of this kind now hanging on our office wall, and which we received from America through Mr. Stillman during the present year. Much to our regret we find that the portion exposed to light through the aperture of the *passe-partout* has become sensibly discoloured, the protected part remaining white. It would be interesting to investigate the cause of this, especially as the light in our editorial office cannot be designated as "intense."

DEVON.—If you wish to obtain pictures having a high gloss you can secure this result by either of two methods:—First, the picture may be "enamelled" by facing it with collodion in the manner so frequently described for enamelling prints. Secondly, the paper may be made to receive a double coating of albumen. The way to do this is to albumenise the paper in the usual mode, and then coagulate the albumen by exposing the paper to the action of hot steam. Paper prepared in this manner is now albumenised a second time with the salted albumen used for such purposes, which is prevented from sinking into the paper by the previous coating, and thus conduces to extreme brilliancy.

REV. W. BARCLAY.—Proceed as follows:—Having placed the negative upon a levelling-stand pour over it a solution of gelatine thus prepared:—Dissolve five ounces of bichromate of potash in a pint of warm water, and six ounces of gelatine in four pints of warm water, and then mix the solutions together. The quantity of this mixture to be applied to the negative ought to be such as would form, when dry, a pellicle of the thickness of a stout card. When the gelatine has become dry expose the negative to the action of light for a period of time varying from fifteen minutes to an hour, according to the power of the light. Next place the negative in hot water in order to remove all the soluble gelatine, by which the picture will be left in a state of high relief. From this relief a plaster-of-Paris mould is made, and from this mould, in turn, a stereotype cast is obtained. We have only given you the process in outline, details will suggest themselves as you proceed.

MELBOURNE.—1. You doubtless have overlooked a paragraph in our last number drawing attention to the appearance of a new edition of a now well-known manual of the carbon process, published by Messrs. Spencer, Sawyer, Bird and Co.—2. Mr. Foxlee, who has written some excellent practical articles on the reduction of wastes, recommends in such a case as yours that a parting assay, which costs very little, should be made. In this way you obtain the *full* value of the metal.—3. The wooden bath, protected as it is by varnish, will answer quite well. The small amount of alcohol which accumulates will not affect the varnish.—4. We shall be pleased to receive the "wrinkles" at your earliest convenience.

TILLEY'S COMBINATION PRINTS.—In order to show that the most perfect softness equally as well as the most complete vigour can be obtained by this process, Mr. Tilley encloses to us specimens of *carte* portraits, all of them having the same background, but each differing from the other in respect of vigour—some being strong and brilliant, others shadowy and suggestive. This proves the process to be capable of yielding any desired effect.

NEW PORTABLE TENT.—We have received from Mr. Bainbridge, of Barnard Castle, a model of a tent, which, among other advantages, possesses those of exceeding portability and simplicity. Taking as a basis on which to elaborate his idea the very simple tent described by Mr. G. W. Wilson in our volume for 1864, in his *Voice from the Hills*, and which consists of an opaque covering to a tripod stand, Mr. Bainbridge improves upon this by having four or more legs specially constructed for the purpose, the double cover, which is black outside and yellow within, being permanently attached to the legs, and which, when distended, are retained in that position by light rods that connect them together. Owing to its pyramidal form when set up, there is but little danger of its being disturbed by a gust of wind. By unhooking the connecting rods the whole tent can be immediately folded together like an umbrella. Judging from the model, the full-sized tent must be quite roomy and capacious. The model may be seen at our Publishing Office.



## MEETINGS OF SOCIETIES FOR NEXT WEEK.

| Date of Meeting. | Name of Society. | Place of Meeting. |
|---|---|---|
| December 6 .. | West Riding of Yorkshire .... | Victoria Hotel, Bradford. |
| " 9 .. | South London (annual meeting). | Society of Arts, John-street. |
| " 9 .. | Manchester.................... | Memorial Hall, Albert-square. |

## METEOROLOGICAL REPORT,

*For the Week ending December 1, 1875.*

Observations taken at 406, Strand, by J. H. STEWARD, Optician.

THESE OBSERVATIONS ARE TAKEN AT 8.30 A.M.

| Nov. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks |
|---|---|---|---|---|---|---|---|
| 25 | 30·05 | SE | 34 | 37 | 39 | 36 | Dull |
| 26 | 30·02 | NE | 33 | 35 | 37 | 31 | Dull |
| 27 | 30·00 | NE | 35 | 36 | 39 | 32 | Snow |
| 29 | 30·05 | NE | — | 35 | 38 | 34 | Snow |
| 30 | 29·87 | NE | — | 33 | 39 | 31 | Snow |
| Dec. 1 | 29·86 | E | — | 31 | — | — | Snow |

CONTENTS.

#### THE BRITISH
# JOURNAL OF PHOTOGRAPHY.

No. 814. Vol. XXII.—DECEMBER 10, 1875.

## SEASONABLE AMUSEMENT.

Christmas time is now close upon us, with its usual round of evening parties and the inevitable troops of children—aye, and adults too—to be entertained and amused. To many the old-fashioned manner of spending Christmas will prove all-sufficient, with its continued round of balls, charade parties, amateur theatricals, and the like; but, in these days of improvement, we have little doubt that others will much prefer at least a slight intermingling of more instructive and scientific amusement.

For this purpose nothing can possibly surpass in utility a lantern provided with a good selection of photographic transparencies. We do not wish to return to the old days of the phantasmagoria lantern and the horrible productions of the brush that generally accompanied such instruments, the effect of which might be to amuse children, but certainly not to instruct. There is, however, a better class of paintings upon glass for lantern purposes, and these, when the work of a real artist and one who understands the special branch to which he devotes himself, form the most pleasing as well as most artistic objects which can be shown on the screen. They are, however, necessarily expensive, and to form even a small collection of such slides would prove a very costly affair. Here it is that photography steps in and enables us at a very small outlay to produce most perfect pictures of objects, animate or inanimate, in every way suitable for the purpose in view. Further: if the charm of colour be desirable it is possible, by means of transparent colours and a little artistic taste, to obtain a result quite out of proportion to the slight amount of trouble involved.

Those who already possess a lantern will scarcely require the hints we are about to throw out upon the organisation of a "lantern exhibition;" while, again, those who do not own such an instrument may consider the information useless although necessary. To the latter we may reply that lanterns and all requisites may be obtained on hire at many of the optical establishments not only in the metropolis but in any of the large towns, and, if necessary, the hirer can be furnished with not only a written lecture, but also an operator to manipulate the lantern. In those cases we should counsel that the entire management be left to the operator. Where, however, the photographer is desirous of being his own operator or his own "lecturer," two or three points require attention.

First of all, the style of lantern and means of illumination. For small private parties it is almost unnecessary to go to the expense and trouble of double lanterns, though the effect is certainly more pleasing; and we should advise those of our readers who are not very thoroughly acquainted with the use of the oxyhydrogen light to be content with the less brilliant illumination given by one of the many forms of lamps now to be obtained. In any case it will be wise to have a special assistant to attend to the gas-bags alone. As regards the size of the disc, we think that under the circumstances mentioned above an eight- or, at the most, a ten-feet disc will be found quite as large as can be satisfactorily shown or will be likely to be required.

The question of the subjects to be exhibited must necessarily depend to a very great extent upon the character of the audience, and, unless forming a consecutive series, should be as varied and distinct as possible in order to avoid sameness. The series of lectures published, consisting of pictures with descriptive lectures, may be made both amusing and instructive; but what will give amongst a party of friends, perhaps, greater pleasure combined with instruction than almost anything else is the description of a personal tour, with illustrations of the places of interest by the way—say, for instance, the last summer's holiday, whether spent on the continent, in the lake district, or in the Highlands. Such a subject worked up by a skilful lecturer and duly furnished with anecdotes and historical incidents picked up on the way cannot fail to afford amusement to both young and old. Another phase of lantern utility lies in its introduction into public entertainments, whether for the amusement of school children, at "penny readings," or for charitable purposes. The same remarks hold good in these latter cases; and if the photographer be not accustomed to appearing in public he may confine himself to his lantern and leave the "spouting" to the village parson or school-master, either of whom will, after one or two private lessons, make a better hand of it than he could himself.

## AN AID TO THE EXHIBITION OF TRANSPARENCIES.

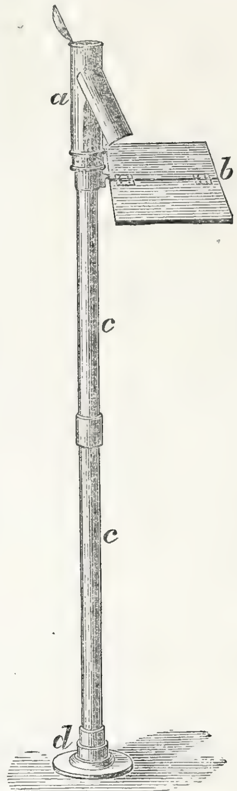
Of the various accessories which conduce so much to the successful exhibition of photographic transparencies by the lantern the reading-desk is one to which every experienced lecturer will accord a proper position. The days, we trust, are now past when photographs are projected upon the screen one after the other without a word of descriptive comment; for, thanks to the enterprise of those who have compiled the numerous volumes of "readings" now issued with lantern transparencies, there are very few localities or scenes of historical or topographic interest either at home or abroad—from the Arctic regions to the tropics—which do not in these "readings" receive adequate description. Hence the exhibition of a selection of lantern photographs is not the uninteresting matter it was at one time; for, simultaneous with the gratification of the love of the grand and beautiful through the agency of the sense of sight, the oral accompaniment of well-chosen illustrative remarks equally appeal to the intellect.

But a written or printed lecture implies the presence of a light for its adequate illumination, the function of the lantern in which it is confined being that of allowing no rays whatever to escape but those which fall upon the desk, the lecturer himself and surroundings being invisible to the audience. Numerous contrivances have been devised for effecting this confinement or, rather, control of the light—from the extemporised pitcher with a hole pierced in its side up to the elegant portable reading lamp introduced a few years ago to meet the requirements of those nocturnal railway travellers who combine the pursuit of literature with their transit from one place to another.

When paying a passing visit, a few days ago, to the establishment of Mr. T. J. Middleton, Little Queen-street, Holborn, we saw a combined lamp and desk which far surpasses anything of a similar kind we have before seen, and we feel assured that a description of this accessory will receive a hearty welcome from those of our readers who have occasion to indulge in lantern pursuits. The desk in

question has been invented by Mr. Wilcox, a metropolitan exhibitor of dissolving views, who, like so many of his brethren, fully recognised the want of such a piece of apparatus, and happily set about supplying the requirement.

In the annexed illustration the reading-desk is shown set up for use. Into a brass socket *d*, which serves as the foot of the stand, is inserted a wooden rod *c c*, the diameter of which is between one and two inches. To facilitate packing, this rod is divided into two pieces, connected at the centre by means of a ferrule. This permits of the stand being divided into two or any number of pieces, which may be of such a length as to admit of its being packed along with or even inside of the lantern case. To enable the most perfect adjustment as respects height to be obtained the stand may be made telescopic, one portion sliding inside of the other.




The top piece *a* consists of a tubular case, or dark lantern-body, inside of which is fitted a candle, in the manner of the portable reading-lamp to which a passing reference has been made, and in which the candle is retained in a nearly-tight brass tube with an orifice at the upper end, against which the candle is continually forced with a considerable degree of pressure by means of a spiral spring at the bottom of the tube. The flame of the candle is thus always kept at the same level. The reading desk *b* is composed of two very thin boards of wood hinged together in the manner shown in the drawing, so as to admit of its being folded together like a book. This desk is attached to the stand by means of a hook at one corner, not shown in the illustration. The aperture in the side of the lantern through which the light is emitted is covered wholly or partially by an adjusting flap, which answers the double purpose of preventing any of the light from falling upon the lecturer and of acting as a reflector and intensifier of that for the lecture itself. The cap or cover of the lantern is shown as it is when thrown back to permit of the escape of the products of combustion. It only remains for us to add that underneath the foot *d* of the stand is a short, stout and taper screw for screwing into the floor; hence the desk is fixed in an erect position by the simple act of pressing the lower end firmly against the floor and giving it two or three turns round.

In the piece of apparatus now described we have combined in the most perfect manner those qualities of portability, lightness, rigidity, and general efficiency so approved of by the nomadic exhibitor of photographic or other lantern transparencies.

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At the last meeting of the Liverpool Amateur Photographic Association the Rev. H. J. Palmer, who has already published the results of his experience with gelatine emulsions in the production of photographs of interiors and other dimly-lighted subjects, described his method of obtaining density when using that emulsion. His plan is in effect the same as the one published by ourselves in an article at page 278 of the present volume, involving the use of chloride of copper for the purpose of "chlorising" the developed image, which is subsequently redeveloped by means of alkaline pyro. without the necessity of further exposure to light. What the precise reaction may be which takes place when the developed image is treated with solution of cupric chloride we are not in a position to say; but, judging from the results of several months' practice with that method, we think it probable that something more than a mere conversion of the metallic image into chloride takes place—that, in fact, some sort of combination takes place between the silver in the film and the copper of the solution. We are led to this conclusion from having observed upon several occasions that the film, after having been uniformly whitened by treatment with the chloride solution, becomes, if washed under a tap, discoloured in those portions—generally the centre of the plate—which may happen to be exposed to the full force of the stream of water or which receive a more thorough washing than the remainder of the surface. This change of colour, which is only visible by reflected light, could not be caused by any ordinary impurities in the water used if the converted image consist merely of chloride of silver; but in what way the presence of traces of copper contribute to the change we can only surmise. Though this discolouration, should it arise, does not in the slightest degree affect the printing qualities of the negative, still it is liable to spoil its appearance, and for this reason we prefer to perform the operation of washing by laying the picture in a dish, or by dipping it into a vertical bath, in order to secure uniformity of result. In applying this method of intensification to gelatine plates it becomes doubly necessary to exercise care in the matter of washing—not only for the reason above mentioned, but also because if the slightest trace of the copper solution remain in the film the application of ammonia at once decomposes it, causing dense brown stains, which are frequently, but not always, very difficult of removal. The gelatine film, from its greater thickness as compared with collodion, retains the solution much longer than the latter. After several months' experience with the chloride of copper we can fully endorse all that we said in its favour in our previous article.

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## SOME MANIPULATIONS WITH THE CHLORIODO-BROMIDE WASHED EMULSION PROCESS.

Coating the Plate.—A convenience with the washed emulsion process is that it dispenses with the drying-box, inasmuch as the plates dry very rapidly (of course plates moist with only a mixture of alcohol and ether dry in a much shorter time than plates saturated with watery liquid containing gum or albumen or both). It is, however, essential to remember that during the time they are drying they are exposed to receive any dust that may be in the atmosphere. This may cause transparent comets to appear during the development. Plates prepared with a preservative bath and dried in a box never show this fault. Taken directly from a bath to a drying-box they are protected from the sources of trouble. It must also be considered that when a plate is passed through a gummy preservative the film receives a thick coat which dries into a protecting shield. Once dry, the film is in a very safe condition; it is even possible that an atom of hyposulphite dust settling upon the film after it is dry would be washed off in the development before it could do injury. The washed emulsion film has no such protection, and needs additional care in consequence.

Much as I like the washed emulsion system I cannot but consider the unprotected state of the film a disadvantage. At one time I held the opinion that one material benefit from using certain substances, such as gum and sugar, in the preservative was that they filled up the pores of the collodion film, and, when washed out in the development, left the film porous and open to receive the developer. This certainly is not the case. A washed emulsion film which contains in it no substance soluble in water receives the developer with perfect facility, and developes with great rapidity. But there is with a gummy preservative the advantage that it shields the film. Albumen does the same thing, with the additional benefit that it imparts certain well-marked and most desirable characteristics to the negative. In fact, it is scarcely too much to say that a dry-plate worker who has given a thorough trial to albumen will rarely be willing to abandon it. The best specimens of dry-plate work from English sources that I have seen have all been made with the aid of albumen. Mr. R. Manners Gordon, although at one time advocating a process devised by himself, and named the "gum-gallic," afterwards abandoned it for another, the details of which have never been published, but which is believed to have been an albumen process. Such was the opinion expressed by the late Mr. Sutton, after working with Mr. Gordon for many weeks, in a long letter published in this Journal in 1872. Mr. Gordon kindly sent me some specimens of his work, which are admirable. It is true that much depends upon the exquisite taste with which the subjects are treated; but then a first-rate worker will always use the very best tools he can find, and albumen imparts a variety of half-tone combined with a general brilliancy of effect which is very charming. The fault of a great

* Concluded from page 582.

deal of dry-plate work of the second class is that in avoiding harshness brilliancy is sacrificed, and there is a deficiency of detail in the shadows, partly to conceal which the proof is under-printed, so that the darkest shadows are only half-tone.

In the case of a washed emulsion I do not think that equally good results will ever be got when it is treated with a preservative not containing albumen. A marked advantage is the following:—When a washed emulsion is prepared without albumen there will occasionally be manifested a tendency to a slight granularity, showing itself in the flat half-tones. (Some plates from unwashed emulsion also show this.) Albumen is a perfect cure for this trouble; not the slightest trace of it has ever shown itself in any plate, washed or unwashed, that I have prepared with albumen in the preservative.

In what I have just said, as to the protective effect of a gum or albumen preservative applied to the film, I make reference to a mechanical rather than a chemical protection; for I believe that washed emulsion plates will have better keeping qualities than those made with a preservative bath subsequently applied, especially when the plates are plunged into the preservative without previous washing (although this method undoubtedly gives the best results when the plates are to be used within a limited time after making).

*Sensitiveness.*—A comparison of sensitiveness indicates a distinct advantage on the side of the washed emulsion. I have recently made trials in this respect, using the same collodion—containing bromide, iodide, and chloride—for both the washed and unwashed emulsion. The plates made with the ordinary form of emulsion (not washed) were passed directly into the preservative bath without previous washing; in this way they have their highest degree of sensitiveness, but it was not as high as the washed plates.

It is certainly remarkable that an emulsion which is in a condition to keep for six months (and probably much longer), gaining rather than losing in good qualities, should give plates which absolutely, without any further treatment, exhibit so high a degree of sensitiveness. The Editors of this Journal recorded, last spring, the following comparative experiment:—Having ascertained that ten seconds was the proper exposure for a wet plate, they exposed a washed emulsion plate made by my formula for ten, and another for twenty, seconds. The ten-second plate was nearly up to the wet plate, and the twenty-second plate fully up to it. This was with an emulsion that had been re-emulsified only twenty-four hours—a circumstance greatly against it. A week is the shortest time that should be given for re-emulsification. Had this been given it is likely the plate would have shown itself equal to the wet with equal exposure—at least in a case like the above, where the light was good and the exposure short.

The emulsion which possesses this exalted sensitiveness retains it unimpaired for six months, and probably for years—a curious contrast with the wet process, in which the film is brought into a condition of high sensitiveness which it retains a few months only and then rapidly deteriorates. If with the wet plate we endeavour to retain this sensitiveness, by taking the plate exactly when it is most sensitive and washing off the excess of silver and applying a preservative we get a dry plate requiring at least three times as long an exposure as the washed emulsion.

*Obtaining Perfect Films.*—It is, perhaps, worth while to advert again here to a precaution which I have mentioned elsewhere, and which applies to every description of photographic work. I mean the advantage of brushing the plate before coating with a stiff bristle brush (such as is used by house-painters), instead of the soft, broad, camel's-hair or badger brushes usually employed. The filaments which give rise to specks often adhere quite strongly to the face of the glass. The soft badger brush goes over them, sometimes, without removing them, and the plate is spoiled. A bristle brush of about an inch in diameter will be found most advantageous. I should be very sorry to return to the old way, so useful do I find the change.

*Development.*—The development of a washed emulsion plate prepared by the chloriodo-bromide process presents no difficulties provided the directions be adhered to; but if a general knowledge of dry-plate development with other processes be depended upon the result will be very apt to be most unsatisfactory. The following is the proper course:—

Provide a sixty-grain solution of pyrogallol in alcohol, a thirty-grain solution of potassium bromide in water, and an eighty-grain solution of ammonium carbonate. The simplest way to prepare an ammonium carbonate solution for development is as follows:—Measure twenty-two ounces of water into a convenient bottle, once for all; paste on the side a piece of paper and draw a line at the level of the water. Whenever a fresh solution is wanted (it should never be kept over two months) a quarter of a pound avoirdupois of hard, flinty carbonate is broken up into small lumps and covered with water, which may be used tepid, but must not be hot. After standing a few hours this is to be filtered into the bottle, and continued until the whole is dissolved, and water is to be added till the mark is reached. For a $6\frac{1}{2} \times 8\frac{1}{2}$ plate four ounces of water are to be poured into a $7 \times 9$ pan, twenty minims of the pyrogallol solution added, and the plate put in, carrying the liquid over the face with one steady sweep. It is then to be taken out and twenty minims each of the bromide and carbonate solutions are to be added and the plate returned. If the exposure have been exactly right the plate will come up to printing density in a very few minutes—almost, or perhaps even quite, as quickly as in the case of a wet-plate development with iron. If the development be not rapid the dose of bromide and of carbonate, *both*, is to be repeated, and, if necessary, a little more carbonate may be added without bromide. The advantage of using the strength just given is that the development proceeds always with twenty-minim doses, leaving less danger of mistake. If great clearness be desired a larger dose of bromide may be used.

In all alkaline developments it is in the dose of bromide that mistakes are most apt to be made. Different dry plates require it in very different proportions—I think because the substances used as preservatives exert an influence upon development, so that a dry plate might require quite a different development if the preservative were washed completely out of it, either before exposure or just before development. The difference would show itself in the need for more bromide, because the gum, tannin, albumen, &c., act as restrainers. Gum and albumen have quite a strong effect of this sort, as is found by adding them separately, in the development of either dry or wet plates.

As the washed emulsion plates contain no restraining agent of any sort they necessarily require more bromide in the development. With the strengths of solution which I have mentioned, viz., thirty grains of bromide and eighty grains of carbonate, there should be as much, or rather more, bromide solution used than of carbonate. This however, will need to be regulated by the exposure; the fuller the exposure the more bromide will be proper.

A question which always comes up in dry-plate development is whether it is better to depend upon the alkaline development or cut it short and redevelope with acid silver. I am inclined to think that perhaps the safest way is to redevelope. Not that there is the slightest difficulty with these plates in obtaining any amount of density desired; on the contrary, printing density will come in less time by leaving the alkaline development to follow its course than by interrupting it to redevelope. The question is a very different one; it is whether the plate will give the more satisfactory print if redevelopment be finished with alkali or with acid. It would extend this paper too much to discuss this matter further here. Next week I will send you some remarks on the alkaline development in relation to dry-plate work generally (without special reference to washed emulsions), with the result of some recent comparative trials as to different modes of management.

*Action of Pyrogallol.*—It is remarkable how little of this substance is really needed for a development. I have tried the effect of using it in the proportion of *one-sixth of one grain* to the ounce of developer, and have brought plates without difficulty up to printing density with this small proportion. Even the directions just given for regular practice involve the use of but about two and a-half grains to four ounces of developer, or a fraction over half a grain to the ounce, and this is ample. I would rather diminish than increase this dose, unless I knew the plate to have been insufficiently exposed.

To succeed best with alkaline development the operation should neither be hastened nor delayed, and to accomplish this the strength of the developer must be varied to suit the case. The alkaline development differs essentially from an acid redevelopment in this—that the latter may be as slow as one pleases (and, if well managed, the slower the better) without the slightest danger of fog if there be not too much silver present; whereas an alkaline development cannot be thus prolonged without the negative losing something of the brightness which one wishes to see. M. Carey Lea.

## HOW TO USE GLYCOCOLL IN THE DEVELOPER.

I regret you did not publish my letter last week *in extenso.* Having given a minutely-detailed formula in your issue of August 20, I say afterwards that a thirty-grain solution of iron with sufficient formic acid and glycocoll to restrain fog is the best developer that I have ever used. It would be useless my giving a precise amount to be added, as that would vary from five to thirty minims, according

to the state of the bath and the collodion; and I need hardly remind you that were I to give a definite amount to be added, and two workers—one using a bath with three or four minims of nitric acid to the ounce, as recommended by me in 1863, and the other a bath just neutral—were to try the process, one or the other would hopelessly condemn it.

My own practice is to have a bottle of saturated solution of iron always ready, and I make my developer for each picture according to subject. In portraiture a black velvet dress requires totally different treatment to a white muslin one, and, in landscapes, a breaking wave to foliage; and the various subjects between these extremes require each special treatment.

But if "R. J. P." wishes to use a standard developer he would, of course, begin by adding as many minims of formic acid and glycocoll as he now does of acetic acid, and from that point of departure would soon, by a few trial negatives, find the minimum quantity required to restrain fog in his state of bath and collodion, and thus to replace the acetic acid.

Should his photographic knowledge (which is evidently *very* limited, or he would have taken this course) be unequal to the above, he would do well to obtain instruction in elementary photography, and ask the advice of any professional photographer with whom he may happen to be acquainted.

It appears hardly courteous to me that when I have, at your request, published a minutely-detailed formula in your columns you allow a correspondent to ask if it is to be "kept back as a secret." I would point out that many of our workers *do* keep their formulæ secret, but that when one is published there is no possible object in keeping its use secret; and, as glycocoll is simply used with the ordinary developer in lieu of acetic acid, it is only ignorance or malice that could make such a remark or ask such a question.

H. Stuart Wortley.

## THE CHLORIODO-BROMIDE PROCESS.

In the last number of The British Journal of Photography appeared an account of Mr. M. Carey Lea's most recent experience with his chloriodo-bromide modification of the washed emulsion process published by him in the early part of the present year. This process, which it will be remembered received considerable attention at the hands of different operators, including the Editors, was variously criticised—some alleging it to be no improvement, the generality of experimentalists agreeing, however, that it was a step in advance. Mr. Lea now appears again before us with the matured experience of a season's work to back him, and reiterates his previous testimony to the good qualities of the process. The advantages gained include the simplicity and certainty of the ordinary washed emulsion process as originally published, in combination with a degree of sensitiveness scarcely, if at all, inferior to wet photography.

Mr. Lea then proceeds to point out one or two discrepancies which have existed between his own results and those of others reported in this Journal, and endeavours to explain whence they arise. In the matter of rapidity he states that most operators, while agreeing that the addition of iodide induces an increase in sensitiveness, fail to attain such an increase as he himself has stated, and attributes this difference to the fact of their having permitted the pellicle to become too dry before applying the organifier. In support of this view he adduces the result of an experiment made some years ago, showing that, of two plates which were permitted to set for different lengths of time before placing them on the washing water, the one washed after the shorter interval was twice as sensitive as the other.

In order to explain this result it would be necessary to know whether the emulsion employed contained an excess of silver or of soluble bromide; the latter I should imagine to be the case, for the reason that, the film being more permeable to water, the restraining bromide would be more thoroughly removed from the plate which was first plunged into the water than from the other, which by longer setting would become more repellent. Besides this, I fancy I remember Mr. Lea to have stated that, to obtain the most sensitive films with his chloriodo-bromide process, it was necessary to allow the plate to *set well* and to wash only until greasiness had disappeared—in effect, to retain as much as possible of the free silver in the film by giving a minimum washing.

In applying this experiment to the present case, however, Mr. Lea at first sight takes identically the opposite view; but when the matter is inquired into the principle remains. The fact is that, in the chloriodo-bromide process, if the *preservative* be applied to the pellicle after a minimum interval has been allowed for its setting the solution penetrates more readily into the pores of the film, and therefore comes more thoroughly into contact with the free silver therein contained than would be the case if the mass had been allowed to become leathery. So far I quite agree with Mr. Lea as to the probable effect produced by an early application of the organifier; but I think, as I have previously shown (*ante* page 461), that what Mr. Lea looks upon as increased sensitiveness is in reality merely a more vigorous development, especially in the details of the shadows, arising from the organic silver salt formed by the combination of the free silver with the organifier.

But, further than this, I believe, and have, indeed, satisfied myself by actual experiment, that whatever may be gained in this respect by early organifying is more than counterbalanced by actual loss—1st, of the organic principle itself, which is washed out of the semi-gelatinous mass; 2nd, of the pyroxyline, which suffers partial solution in the diluted ether and alcohol contained in the partially-dried mass; and, 3rd, of the pellicle carried away in small fragments during washing, owing to the rottenness of the product.

Mr. Lea then proceeds to speak against the use of glycerine as recommended by myself for the purpose of facilitating the removal of soluble matter. My reason for thus using the glycerine was based upon its well-known power of preventing the thorough desiccation of any film containing it, and it was intended to perform the same office as Mr. Lea's early washing of the pellicle, but without the defects of the latter plan. As to the alleged effect of glycerine in lengthening the exposure, as stated by Mr. Lea, I cannot see the practical possibility of such a result on the part of a neutral substance, unless it act mechanically by causing the too complete removal of the free silver from an emulsion during washing and previous to organifying; but in no way is it capable of such action as applied to Mr. Lea's method, its only effect being to cause the more rapid permeation of the preservative throughout the body of the pellicle. Personally I have found, in working my own form of washed emulsion with a slight excess of bromide, that the sensitiveness is greatly increased by the use of glycerine, owing, without doubt, to the more perfect removal of the restrainer. Of course, if the glycerine be employed in the presence of free silver, care should be taken to obtain a perfectly pure sample.

In the next paragraph upon "re-emulsifying" Mr. Lea shows distinctly the weakness of his method, or, perhaps I should say, proves the correctness of the remarks I have made above upon the loss of pellicle during washing. He finds that his pellicle, when re-emulsified with equal parts of ether and alcohol in the proportion of twenty grains of pellicle to one ounce of solvents, does not possess sufficient solidity, and it becomes necessary to add additional pyroxyline. When it is considered that the original emulsion is made with a full dose of cotton to each ounce it must become pretty evident that a loss has taken place somewhere during the operation of washing, and that the sensitive silver salt in the second emulsion does not stand in the same proportion to the pyroxyline as it did formerly. I have myself never had occasion to add fresh pyroxyline, nor have I yet seen in it any advantage when a proper time is allowed to elapse before organifying the pellicle.

Finally: Mr. Lea's remarks upon the improvement of the emulsion by keeping are quite in accordance with my own experience upon the point, though I do not go to the extent of saying that an emulsion is not fit for use until a week after re-solution.

W. B. Bolton.

## EXHIBITIONS A STIMULUS TO ADVANCE TRUE PROGRESS IN ART-PHOTOGRAPHY.

[A communication to the Edinburgh Photographic Society.]

Permit me to explain at the outset that my connection with the matter for consideration and discussion tonight has been brought about in consequence of a motion I made at a recent meeting of Council, to the effect that, as several years had elapsed since an exhibition of photographs was held under the auspices of this Society, it would be very desirable that some efforts should now be made in that direction, and I suggested that we might endeavour to secure as a nucleus to start with some of the best pictures from the London Photographic Society's exhibition before they were returned to the exhibitors. I was then informed that a suggestion had already been made privately to transfer the whole of that exhibition to this Society; but the expense of the undertaking was found to be too great, and it had, therefore, to be declined. My object was not so much to have this wholesale transfer, but rather that a judicious selection should be made, and our own members and others invited to contribute, so that we might calculate on a fairly good average collection of pictures. Most members of the Council were of opinion that it would take members of the Society generally rather at a

disadvantage, and that they could not exhibit on favourable terms if longer time for preparation were not allowed.

It was therefore agreed to postpone the intended exhibition until the end of next year, in order that sufficient intimation might be given to all parties concerned in the matter, and that we would then be better able to secure a larger number of contributions from all available sources. In order that the Society's funds might not be burdened with any very heavy pecuniary responsibility in the matter, it was resolved to form a guarantee fund for the necessary expenses connected with the undertaking. You will be glad to learn that a good amount of encouragement has been already obtained, and the large gathering of members tonight shows an interest in the movement that augurs well for its ultimate success.

Former exhibitions of photographic art held in this city, if my memory serve me right, were not eminently successful in any point of view. This might be accounted for by the fact that they were rather too local in character; and it is scarcely to be expected that the outside public will care to patronise an exhibition of mere ordinary photographic portraits that can have no possible interest for anyone beyond the immediate circle of friends or acquaintances of the subjects. Therefore such an exhibition as we purpose having next year—if it is to be made successful in its advancement of art-progress, and of more than ordinary interest to all—must be largely made up of contributions from the works of the foremost men in our ranks, both amateur and professional, at home and abroad. It is also to be hoped that these exhibits will not merely be a collection of the "essences" of mechanical perfection of processes, or even of pictures devoid of any definite object in treatment. Let us anticipate, rather, that every exhibitor will strive to uphold the honour of his art by endeavouring to infuse into the composition and general arrangement of his pictorial conceptions as much real art-knowledge and originality of ideas in sentiment and feeling as must tend to stimulate and promote the advancement of true progress in our art; by so doing competition in art-excellence is encouraged and wholesome prosperity for the art secured.

In looking back for some time I am afraid it must be admitted (speaking generally) that there has not been that amount of art-progress in connection with the practice of photography that might be expected, considering the experience acquired during those years; and this may be accounted for in a great measure by the simple fact that for many years past a great demand has been made on the time and energies of our professional members, in providing for the supply of large numbers of the popular *carte-de-visite* portraits—a style of picture which does not give much space or scope for real artistic ability—so that a large proportion of the profession have been quite contented to run in a groove, so to speak, and have not cared to venture much in what may be termed the higher walks of art within the capabilities of the practice of photography. But, now that there exists a demand for a larger and better class of picture, it is quite apparent that the artistic skill required for these small pictures will be quite inadequate when taxed to produce the necessary amount of artistic excellence required to make the larger pictures thoroughly successful; and, if it be admitted that more art-knowledge and culture is required for the production of the larger sizes of photographic pictures or portraits, it will also be agreed that this Society could not do less than give its name, influence, and support to the proposed exhibition, as a certain means of fostering and encouraging our art-progress and education in this praiseworthy direction.

The followers of the older arts—painting and sculpture—are upheld and advanced in their progress by the facilities given in their schools of art and annual exhibitions, and they are stimulated to greater efforts in their future labours by the comparisons they are there enabled to make of the works of their brethren, and by the appreciation and encouragement bestowed by a discriminating public on their exhibitions; and if these exhibitions are still considered a necessity for the advancement of progress in relation to arts of such antiquity, how can it be expected that our photographic art can make telling progress if year after year goes on without any special inducement being offered to assist us out of the ruts of a contented and non-progressive art-practice?

We have a striking illustration of the increased impetus that can be given by these exhibitions in promoting art-progress in connection with photography in the United States, where, until within the last few years, they had no special organisation for such a purpose; now they have a very flourishing National Photographic Association holding an annual congress and exhibition by rotation in the various cities of the Union, and it is said that to our Western brethren, who thought their work left nothing to be desired, these exhibitions came like a new revelation. They found that their most valued productions looked tame, commonplace, and comparatively worthless when placed beside the works of masters in the art. The result has been that many of them began at once to aim at higher efforts, and every year's successive exhibitions have shown that great progress and success has been achieved through their aid.

To come nearer home: it will be remembered that a very great stimulus was given to the artistic abilities of the photographic profession by the exhibited portrait work of M. Adam-Salomon, at the Paris International Exhibition of 1867, and certainly nothing up to that time had ever been exhibited that could be at all compared with these pictures; they were simply perfect.

It is not within the province of this paper to treat of the technical difficulties that stand in the way of the artistic photographer being able to give due embodiment to his pictorial fancies or compositions on account of the non-plastic nature of the materials with which he has principally to deal. But we need not be discouraged; their optical, chemical, and mechanical difficulties can all be overcome. "*Nil desperandum*" must be our motto, feeling assured that the mere attempts we may make to secure more artistic feeling and sentiment in our work will be most valuable to us as a means of art-education, and will, at the same time, serve to unite in a large measure the higher qualities of art and the truth of photography. Without appearing to be invidious in quoting names we have only to look at the works of the late Mr. O. G. Rejlander to learn what has been done in this direction. We can see at a glance what a field is open for cultivating the production of such a class of subject or *genré* pictures. In these pictures we see that variety of true expression and feeling, natural ease of pose, and originality of sentiment *can* be successfully secured by photographic agencies; and what has already been so well done is within the reach of all who will make studious efforts to obtain like results.

Now and again it is the practice of some critics, who are jealous of the rapid advances made by photography since its early days, to seek to decry its capabilities and say it cannot take rank among the fine arts because it is not purely an imaginative or creative art. But it surely will not be denied that the artistic photographer can stamp his individuality upon his work, and by the aid of his art give impressions of the conceptions of beauty (whether of form or sentiment) existing in his mind; and, if the ability to do that much be granted, we have at all events reason and justice on our side in claiming a position among the fine arts. However, be this as it may, we can take courage in the knowledge that our art enables us to do more than give merely imaginative effects. The evanescent beauty of rolling clouds and breaking waves have been successfully transfixed, joy and sorrow and all the varying emotions of the mind acting on the human countenance have been faithfully portrayed, and the beauties and grandeur of natural scenery can be rendered in the most truthful manner. Even photographic portraiture in the hands of men of artistic culture and taste can be graceful in arrangement, expressive and truthful in character, and the *tout ensemble* of the picture will be found thoroughly in accordance with all the rules that guide in art; and the rapidity with which our manipulations are conducted often enables us to "snatch a grace beyond the reach of art."

The appeal that will now emanate from this Society to our art-brotherhood for their assistance to form an exhibition illustrative of the artistic capabilities and development of the art will, it is to be hoped, call out a host of contributors whose works will show that they are fully competent to sustain and advance the progress of our much-loved photographic art. Alexander Asher.

## A FEW WAYS OF PRINTING-IN BACKGROUNDS.

In some establishments putting backgrounds to portraits is a very important matter in the printing department; some, again, rarely do it on account of the excessive trouble supposed to be attendant upon accurately registering negatives and masks; and some, when they have done it, are so dissatisfied with the result that they rarely practise it. In the following hints I will endeavour to show that not only artistic results can always be ensured, but that the securing of them is a comparatively easy task. Care and judgment are necessarily required to produce a picture worth looking at; but similar conditions are required to produce most other things that have any pretensions to art-qualities. That this class of work requires more skill than many other photographic manipulations I cannot allow. An intelligent operator will find it extremely easy to produce such work of the best kind by carefully complying with the rules here laid down.

*Imprimis:* it is requisite to have a suitable subject. *Any* landscape or interior, no matter how charming in itself, will not do; the most unpretending and simple subjects are frequently the most suit-

able. The landscape part of the picture should never challenge attention before the figure or group, to which it is merely an accessory, but must always be kept in subjection, and adapted by the formation of its lines to the pose of the figure intended to be present with it—one pose requiring one landscape, another a different one, and so on. This selection is one of the most important matters, and if neglected the resulting picture will be a failure, no matter how carefully the remaining manipulations are performed. The figure *must* be taken with the foreground if intended for a full-length, otherwise there is an inlaid, unreal appearance that no "dodging" can ever remedy; consequently, the idea of making a good picture of this kind from any old full-length negative portrait is a delusion. It cannot be done. Three-quarter or other portraits *not* including the feet and immediate foreground may be managed tolerably well, although not originally taken with a view to this kind of finish. Supposing, then, we have a suitable landscape negative, we proceed to take a negative of the figure or group *with* the foreground, using a plain background rather light in colour and capable of being inclined at different angles to produce a graduated shade where it may be required.

This blotting-in, as it were, of indefinite shadows is easily accomplished, and is useful for producing a suitable ground for the landscape or interior to be afterwards printed in, causing the whole to harmonise better than if a plain, even background were used. This negative is to be dried and varnished in the usual manner, and a proof taken of it. Now with a pair of sharp scissors cut out the figure and foreground from this proof, and allow it to darken in the light. No particular care is required in doing this so long as the general outline is fairly kept. Grass and stems projecting singly above the general level of the ground need not be considered. Attach this mask with gum, *face* on, to a piece of glass and dry.

A landscape negative must now be selected in which the lines of the perspective converge to a point on one or other side of the figure, if the figure be in the centre of the picture; but if, as in the case of a group of two, the centre be left open the point of convergence may be made to occupy the space. By placing the print of the figure upon the landcape negative the proper position is readily ascertained; and if the landscape negative be taken on the same sized plate as that of the figure the manipulations are facilitated. The position being decided upon, the print is retained there by a piece of cardboard made to bend in the centre like the back of a pressure-frame, for the purpose of examining the printing. The mask attached to the glass is now laid carefully on the back of the landscape negative, so as to shield the figure and foreground, and may be attached by a bit of gummed paper, although I have never found it necessary. The whole must now be placed in a *diffused* light proceeding from a direction at right angles to the plate—say in a room under a skylight, or a similar position. In no case must the printing be done in a direct sunlight, or carried so far as to be equal in depth to the figure —about half the strength being a fair average. The landscape negative should be very thin and of rapid printing quality.

A stock of landscape and interior negatives taken for this express purpose should be kept in store, thin and bright. An ordinary negative is much too dense, and the attempt to put in a background from such an one would in all probability be a failure. In diffused light of an average intensity the printing of this part should be completed in about six or eight minutes. Atmospheric effect is required to throw the figure into as much relief as possible, and at the same time the printing must be sufficiently deep to harmonise with the foreground; a few trials will soon demonstrate the happy medium. The head of the figure should in a general way be relieved against the sky, or against very faint objects in the distance. Unless this be borne in mind the picture will look a muddle, and the figure will not come properly off the background.

If trees form part of the subject they should be absent on one side of the picture, or, if there, of much smaller dimensions, and fainter by being represented on a more distant plane. It is generally better not to attempt *continuity* of background and foreground, but represent the foreground as rather raised to give the idea of a certain space of unseen distance between the figure and objects in the background; this also helps to give relief and a more natural effect to the whole subject. These directions apply to all compound pictures of this class, the difference being in the method of masking.

Another way of doing this is by laying a piece of glass over the figure subject and painting a shield in black varnish, in all other respects proceeding as already directed. Again: another way is to paint on the print itself with pigment mixed with gum over those parts to be protected from the further action of the light. If this method be chosen the print can be put in a press with the landscape negative and printed in the ordinary light without any regard to its direction, care being taken to see that the pigment is perfectly dry, or it will stick to the negative of the landscape and spoil it. Excellent results can be obtained with either process.

If an old negative is to be utilised that was not originally designed for this purpose the background of it must be carefully stopped out with black varnish. Make a mask in the usual way, and tone and shade the white paper resulting from the stopping-out, the figure being in the meantime protected by the mask *before* proceeding to put in the landscape. Very presentable results may be obtained in this manner. Other ways of producing these compound pictures may be adopted, and to which I shall allude at some future period. For the present I will conclude by recapitulating the points to be particularly borne in mind :—

Never print backgrounds too deeply. Always select those suitable for the subject, with special reference to the drawing. Never print in direct sunlight, but always in diffused light. Use much thinner, quicker-printing negatives for the backgrounds than for the figures.

EDWARD DUNMORE.

## ON THE EFFECTS PRODUCED BY THE ADDITION OF COLOURING MATTER TO BROMISED COLLODION FILMS.

SINCE last writing I have continued my experiments in photographing the spectrum on stained dry bromide plates; and though I have not yet finished the investigation sufficiently to arrive at any result conclusively proving the correctness or otherwise of Dr. Vogel's theory, and must, therefore, defer the full account of my experiments, the following brief *résumé* of some results I have obtained may be interesting.

In these experiments I have used plates prepared with bromised collodion, without any preservative, well washed and dried. The dyes have been added in some cases to the collodion, and in others applied in watery solution after washing, the superfluous colour being removed by further washing.

A dry collodion film containing plain uncoloured bromide of silver is at least as sensitive to the red rays as any of the coloured films as far as regards the *extent* of the action, but not its *intensity*. Wet bromide developed with iron has nothing like the sensitiveness of the dry plate, nor has a moist plate developed with the alkaline developer. This has been observed by Dr. Vogel.

*Napthaline red* heightens the action of the yellow rays, and decreases that of the green and red.

*Roseine* markedly heightens the action of the yellow rays, decreases that of the green, and appears to have the same action as regards the red rays as napthaline red; but on plates slightly fogged I have observed reversed action, extending below the visible red. The action of the ultra-violet rays, also, seems to be increased by this dye.

A red dye prepared by Judson, called simply "*red*," smelling strongly of turmeric, increases the action of the yellow rays considerably, and, in a less degree, of the red rays, but decreases the action of the green.

The action of *annatto* is something similar to the last.

I have not quite determined the action of *coralline*, but it appears to increase the action in the green more than the dyes already noticed. With long exposures faint action is continued to the end of the visible spectrum, and the blue region is strongly reversed, showing the lines from below H nearly to F with great distinctness, dark on a clear ground.

Judson's *orange* heightens the action in the blue and green; below E the action gradually grows fainter, and may just be traced to the end of the visible spectrum. On some plates slightly fogged I have obtained a faint image of the A line reversed.

*Phosphine* (Judson's) produces an effect somewhat similar to the orange as regards the blue and green, but all action ceases at D on an unfogged plate.

*Napthaline yellow* seems to weaken the action of the spectrum generally. The strongest action is in the blue, below F; faint action continues to about B.

*Picric acid yellow* acts in a very similar way to the last.

I have not been able to determine the action of *green* dyes satisfactorily. The mixed greens do not work well in collodion, and when applied in watery solution do not stain the film a good green. I am expecting some suitable samples from Europe.

*Chlorophyll* heightens the sensitiveness in the red, with a marked band of increased action about B, as noticed by Becquerel.

The action of *blue* dyes is nearly always identical with that of the yellows; strong action is confined to the blue, and then gradually decreases through the green and yellow to about B. I have never had a trace of increased action in the orange with several blue dyes I have tried. On slightly-fogged plates reversed action has been distinctly visible on the red above and below A.

*Purple* shows strong action between H and F, weak action between F and D, strong action again between D and C, followed by gradually decreasing action to *a*, these boundaries of action being very distinctly marked.

*Violet* acts in a similar way to the last.

In nearly all cases of long exposure of stained and unstained bromide plates the spectrum is reversed in the blue and violet regions between H and F, and in many cases the lines come out with great distinctness reversed—that is, dark on a clear ground, instead of clear on a dark ground. This effect seems also partly due to the action of the alkaline developer, and is more marked on plates of certain colours than on others.

I have already mentioned a reversed action of the red rays noticed on plates stained with roseine and slightly fogged. This effect has also been observed on plates stained with other colours—orange, green, and blue—but I have found it most marked on plates stained with an aniline blue dye obtained in the market here. In alcohol the solution is of a very deep fine blue, but the watery solution is a rich violet or purple. On plates stained with this dye of a light lavender tinge when dry, and which were slightly fogged after development, I obtained very distinct images of the A and other lines in the red reversed, and also three or four groups of lines in the extreme red below A.

On plates stained with the same dye, but perfectly free from fog, this reversed action was not perceptible, and direct action with long exposures only extended as far as C. As I had not obtained any sign of this reversed action in the red or plates prepared with bromide of silver alone unstained, I had attributed it to the action of the dyes, but now it appeared to be evidently connected with the fogging. Recollecting that in the early days of the daguerreotype, thirty years ago, Sir J. Herschel, Draper, Fizeau, and Claudet had observed a similar reversing action of the red rays on plates that had received a short preliminary exposure to white light, I tried the effect of a similar preliminary exposure of one of the stained dry plates before subjecting it to the action of the spectrum, and, as I anticipated, a strong bleaching action manifested itself in the red part of the spectrum, and after development the plate showed a reversal of the whole spectrum, from above H to below A, with a minimum of action about F.

This action of the red rays has not, so far as I have been able to ascertain, been noticed before on collodion plates, and is certainly a most interesting extension of Dr. Vogel's valuable and important discovery of the effect of dyes in modifying the action of the spectrum upon dry bromide plates. I need not mention the practical advantages likely to accrue from the application of this method in spectroscopic photography.

I have not yet had time to ascertain the action of the red rays on plates stained with other dyes than the particular blue I have mentioned, and subjected to a preliminary exposure to white light; but I know that the reversing action may be expected on many others, and I have reason for believing that under some circumstances it may also be obtained on wet plates with iron development.

I shall investigate the subject further as I have opportunity—now, unfortunately, very scanty—and hope to make known the results more fully on a future occasion. J. Waterhouse, *Captain*.

## FOREIGN NOTES AND NEWS.

Draft of a German Photographic Copyright Law.—Curious Trial.—New Photographic Society at Frankfort-on-the Maine.—Prevention of Cracking and Peeling Off of Glue Benzine.—A White, Lustrous Film for Diapositives.—Remedy for the Metallic Appearance of the Face in Certain Portraits.—New Method of Retouching.—Enlarging from Photographs Without Using Apparatus.—A New Method of Obtaining a Quantitive Analysis of Silver.—Restoring Old Iron Developing Solution.—Cleaning Old Daguerreotypes.—M. Despaquis' Process.—New Publications.—A New Photographic Society.

According to the *Vossische Zeitung* and the *Börsenblatte für den Deutsehen Buchhandel* the draft of a much-needed law for the protection of photographic copyright is now before the Bundesrath, and, if not rejected by the Reichstag, as happened some years ago, may soon be expected to come in force. The draft consists of eleven paragraphs, and the sense of it is, briefly, that the right of reproducing a photographically-obtained work belongs to the maker of the original photograph. It is considered an infringement of that right to copy a photograph by any other mechanical process, except in the case of manufactured articles or reproductions of a copy of the original photograph. The copyright of the original producer holds good for five years, and can either be transferred by the owner or inherited by his heirs. Every photograph must have on it the name and address of the producer, or the name of the producer and the name and address of the transferee, on pain of forfeiting the protection afforded by this law. Photographs already protected do not come under its operation, nor, should it come into force, will it have any retrospective power. Many journals are energetic in their expressions of regret at this latter provision.

Last month a rather curious case was tried by the Berlin Court of Appeal. A photographer called Assmann, residing at Stetin, gave a large order for *carte*-sized mounts, bearing his name and address, to a cardboard maker in Berlin named Schlag. On the completed order being sent home several hundreds of the mounts were returned on account of an error in the printing. These rejected mounts Schlag sold to several tradesmen, and amongst others a hosier called Schütz obtained a quantity of them. Schütz then obtained a number of unmounted male and female portraits, which he pasted on to the mounts he had bought from Schlag, and put the whole collection into a "magic box," from which, for the large outlay of one silbergroschen, a person desirous of prying into the future might draw the portrait of his or her destined wife or husband, as the case might be. With his "magic box" Schütz visited the annual fairs, and in the course of his travels reached Stetin. Here Assmann's maid servant also went to look for her "*futur*" in Schütz's box, and her astonishment may be imagined when she found her master's name and address stamped on the face of the precious portrait. On her return home she informed Assmann of her discovery, and the latter at once sent the police to search the magic box, where they found several hundreds of similar pictures. His next step was to sue Schlag and Schütz for compensation for the damage done to his professional reputation; for, as he averred, many of his customers had left him because they feared he would make an improper use of any rejected copies of their portraits. The defendants were fined 150 merks each, but they appealed to the higher court, which remitted the fine in the case of Schlag, whose defence was that he only disposed of rejected mounts to persons who lived at a distance from the original orderer, and that the injury done to the pursuer was unintentional on his part. Comment is needless. The uncertainty of the law is proverbial.

The Emperor of Austria has just decorated Franz Antoine, a photographer, with the gold medal for art and science.

An association for the promotion of photography and the kindred arts has been set on foot at Frankfort-on-the-Maine, and already numbers sixty members.

The last number of the *Archiv* contains a very unfavourable review of Dr. Van Monckhoven's *Historique du Procédé au Charbon*. It says, in the first place, that the *Historique* is a mere compilation of the specifications of the various carbon patents, not always very correctly translated; and, in the second place, that the author's principal object seems to be the obliteration of the name of Johnson from the list of the improvers of the carbon process.

The following notes are also culled from the "Miscellanea" of the same journal:—The addition of a little calcic chloride to glue prevents the latter from cracking and peeling off, as this very deliquescent salt prevents the cement from drying to a brittle condition. Glue with this addition adheres to glass, metal, &c.

Now that a solution of wax in benzine is so much used, especially in the production of enamelled carbon prints, it may not be superfluous to remind our readers that petroleine benzine should not be used for dissolving the wax, but the more expensive benzine refined from coal, as with the latter the pictures are more easily and smoothly removed from the glass. One should not forget either that benzine must be poured into perfectly-dry bottles, as water and alcohol cause it to become turbid. Benzine can sometimes also be used instead of oil of turpentine for dissolving wax and resin for pulling carbon prints from zinc plates; in that case the plates do not require to be carefully cleaned every time. Some time ago we gave a reaction for distinguishing pure benzine from that adulterated with petroleum.

In the *Archiv* Herr R. Schlegel recommends as a useful film for copying glass diapositives a solution of gelatine well mixed with permanent white spread over the glass. The film furnished by zinc white shows a grain when one looks through it.

Herr J. Menzen, of Barmen, thinks that the primary cause of the metallic appearance of the face in certain portraits, to which Dr.

Schnauss called attention a few weeks ago, is to be found in the temperature of the studio. It generally makes its appearance in the summer time, when the dryness of the air causes it to absorb so great a proportion of the water of the silver bath, especially in the case of flat baths, as to alter its strength very materially, and, indeed, to bring it to a strength which ordinary iodised collodion cannot bear. The remedy he recommends is to add a little water to the bath and then filter, after which treatment he has always found that the objectionable appearance was removed.

Dr. Liesegang says M. Sellbach, of Antwerp, lately showed him a new way of retouching negatives which is said to be much more quickly done than the ordinary pencil retouching. The negatives are not varnished but coated with a solution of india-rubber, and when dry the places which one wishes to make opaque are polished with pieces of wood cut across the grain. In this way the silver deposit is made thicker and, consequently, less transparent. Dr. Liesegang tried this plan unsuccessfully upon unintensified plates, but thinks it may work better with intensified negatives.

Dr. Liesegang has lately visited Paris, where he got an explanation of an enlarging process which seems to have perplexed him for some time. In many studios, both in Brussels and Paris, he saw very artistically-finished life-sized portraits in black chalk, which were said to be enlargements from *cartes de visite*, but did not appear to be enlarged by any process with which he was acquainted. He naturally made inquiries as to the way in which they were produced; but no one either could or would afford him any information upon that point until he chanced to make the acquaintance of the artist whose work these beautiful enlargements were. When Dr. Liesegang visited the artist's studio, which is situated in a high house in a little-frequented street in Paris, he was surprised to find it filled with rare plants, foreign birds in enormous cages, pictures and studies, but no sign of any photographic apparatus. The mystery, however, was solved as soon as he saw the artist at work. An unfinished picture stood upon the easel, at the left side of which a *carte* portrait was stuck in a holder, and in front of that a magnifying glass. The whole secret is—that the enlargements are not produced by photography at all, though they are so like photographs as to have deceived even experienced photographers, but that the artist looking at the *carte de visite* through the magnifying glass draws the portrait with chalk upon the cardboard placed on the easel. Dr. Liesegang was amused at the skilful way in which the shadows and half-tones were brought out, by scribbling the chalk lightly on the place where the shadow is to go and then rubbing it with the little finger; but, though everything depends upon the skill with which it is done, there is nothing new in an artist rubbing in his shadows with his finger if he prefers it to a stump. These pictures seem to be much appreciated, for Dr. Liesegang says as much as £20 is sometimes obtained for one. A single portrait in this manner can be finished by the artist in question in two or three days, or even in less.

The *Archiv der Pharmacie* says:—The new method of obtaining a quantitive analysis of silver proposed by J. Volhard is founded upon the fact that soluble compounds of rhodium cause a white curdy precipitate of rhodide of silver in acid solutions of silver. In addition to the precipitate of rhodide of silver, the silver solution gives also the blood-red solution of ferrous-rhodate, but its colour disappears immediately. If one, then, drop a solution of potassic rhodide or ammonic rhodide into an acid solution of silver, to which a little ferrous sulphate had been previously added, each drop of the solution of rhodide causes a blood-red cloud, which, on the liquid being stirred, disappears again and gives place to the former milky-white colour. At first, however, if all the silver be precipitated as rhodide of silver, the colour of the ferrous rhodate remains; so that, if one know the quantity of dissolved salt of rhodium required to precipitate a given quantity of silver, one can determine the quantitive analysis of the silver contents of any silver solution. This method is capable of very general application, since it permits the certain and speedy recognition of all substances, such as chlorine, bromine, and iodine, precipitable by silver from an acid solution, because they can be completely precipitated from a silver solution of known contents and the excess of the added silver is thrown back again with a solution of rhodic salt; and, besides that, Volhard states that the new method can also be used for the determination of the above-mentioned elements in organic combinations. Further: the new method has some very substantial advantages over Mohr's process, which has potassic chromate as its indicator:—1. It can be used with acid solutions, while Mohr's method presupposes neutral fluids—a limitation which greatly interferes with its usefulness. 2. The compound the colour of which serves as an indicator is soluble, and its retro-action is much more easily recognised. 3. The salt which serves as an indicator—the solution of ferrous sulphate—is colourless, and can, therefore, be added in greater quantity.

For the production of the precipitating liquid Volhard uses ammonic rhodide. Since this salt is too hygroscopic to allow of its being accurately weighed out, the solution is exhibited in a silver solution obtained by dissolving ten grammes (or, better still, 10·8 grammes eq. O, 1) of pure silver in nitric acid, which is then diluted to 10000,0 cubic centimetres. On the other hand, a large quantity of ammonic rhodide is dissolved in water so that some eight grammes go to the litre of the solution. Ten cubic centimetres of the silver solution are then measured into a beaker, and some five cubic centimetres of a solution of pure ferrous sulphate (containing some fifty grammes of ferric oxide per litre) and from one hundred and fifty to two hundred cubic centimetres of water, are added. From another beaker now pour the ammonic rhodide, stirring it constantly meanwhile, until the fluid becomes of a stationary light-reddish tint. Supposing 9·6 c. c. of rhodic solution to have been used to 10 c. c. of silver solution, then 960 c. c. of the former are diluted in 1,000 c. c. of the latter. A cubic centimetre then contains ten or 10·8 milligrammes. Before using it this solution is tested again. To do that take one gramme by weight of pure silver, dissolve it in eight or ten c. c. of nitric acid, and heat it in a sand bath until it retains no trace of nitrous fumes; add some five c. c. of iron solution, and finally dilute it with some 200 c. c. of water. After it has cooled the rhodic salt is poured in, stirring meanwhile as before. As the last drops of the hundredth centimetre are added the red colour should appear distinctly and permanently.

The American correspondent of the *Moniteur de Photographie* describes a method of restoring old solutions of sulphate of iron which have become discoloured by age. This method, which is due to Mr. R. Barrow, consists in adding, drop by drop, to the altered solution ordinary sulphuric acid, which has the effect of bringing back its original colour and qualities; and, further, after this treatment the developer remains good for a considerable time.

Another American operator, Mr. Simons, has recently published a simple plan for renovating faded and defective daguerreotypes—one of the most thankless tasks generally which a photographer can well undertake. He commences by removing from the back of the plate any extraneous matter which may have become attached to it—such, for instance, as wax, glue, paper, &c. This may be done by scraping with a knife, taking care not to cut the metal. It is better to avoid the use of water; but if such a course be necessary it is important that none of it should touch the face of the picture, and, above all, that it be not allowed to dry there, the inevitable result of which would be an indelible mark. After cleaning the back, the face is carefully washed with pure water in the same manner as a negative is washed, and while the picture is still damp flow it with strong liquor ammonia, followed by a second washing in clean water, after which the plate is allowed to dry spontaneously. This is said to restore the picture to its pristine brightness. Mr. Simons advises that cyanide should never be used, except in the most desperate cases, and when all other efforts have failed.

At the November meeting of the Photographic Society of France, which was the first of the new session, M. Despaquis explained the advantages of his new process of printing in fatty inks. The chief advantage consists in securing a solidity in the gelatine film which has never hitherto been attained, but which M. Despaquis claims at length to have succeeded in bringing about by means of a supplementary exposure. After exposure under the negative the bichromatised gelatine, which is supported upon a plate of glass, paper, cloth, or other translucent material, receives a second exposure from the reverse side until such time as the image already formed under the negative commences to become clouded and to disappear. The effect of this second insolation is to render the under side of the film insoluble, and to prevent its becoming detached from the glass, while, at the same time, the front portion remains soluble to a sufficient depth to absorb the requisite quantity of water to repel the greasy ink and form the printing surface. By lessening the extent to which the gelatine film swells when damped, and also by means of a new system of damping, the difficulties previously experienced in inking the proof are very much decreased, while the proofs may be pulled in sufficiently rapid succession to render it possible to print by machinery, instead of by hand as heretofore.

Amongst the new works recently published in France we may mention a *Treatise on Photographic Retouching*, which has been

issued anonymously from the establishment of M. Carette, of Paris· M. Klary has also written a pamphlet describing a *New Method of Lighting the Sitter* by means of a movable screen. In addition to these M. Cordar has published a third edition of his *Traité des Insuccès*.

A new amateur photographic society has been recently formed at Toulouse, which already numbers a large body of working members. The society publishes a journal which, since its commencement, has borne testimony to the energy and ability of the members of the young society.

# Our Editorial Table.

### Photographs of the Albert Memorial.

London: A. and G. Taylor.

Whether the sumptuous monument erected to perpetuate the memory of the late Prince Consort be or be not the most fitting way in which his good qualities and virtues may be held up for the encouragement and emulation not only of the present but of future generations, there is no doubt whatever that in the Albert Memorial—now, happily, brought to within a very brief period of its completion and unveiling—we have a work which will certainly hold up to admiration the talent and genius of Sir Gilbert Scott, the architect of this elaborate and costly structure.

It would be out of place here to dwell upon the architectural features of this great work; it is enough to say that it is replete with statuary composed in groups of the most artistic nature, the individuals comprising these groups being, in all cases, those renowned in the worlds of poetry, music, painting, architecture, and sculpture. Is it, then, a matter for wonder that a work of this character has afforded a fitting and most fertile theme for the operations of the photographer?

Among those who have undertaken the task of producing a complete series of photographs of the *chef d'œuvre* of Sir Gilbert Scott, and the sculptors of eminence by whom his idea has been carried into practical form, are Messrs. A. and G. Taylor, of Queen Victoria-street, who have in the fine pictures before us produced most worthy representations of the Memorial and its sculptures—the former in its completed form, the latter each complete in itself and in all the minutest details. These pictures are eleven by nine inches in dimensions, the points of view being selected with the greatest care so as to bring out the various features of the work with full effect; while the light, upon which the effective rendering of statuary so much depends, has been obtained of such a degree of force and in such a direction as to render the minutest detail with great clearness. While a singular amount of vigour characterises these photographs, that vigour is very far removed from harshness.

Of the four lower groups of sculpture, representing the four continents, those of Asia (by John Henry Foley, R.A.) and of Europe (by P. Macdowel, R.A.) are probably the finest in respect of photographic rendering.

The pictures are printed on delicate rose-tinted paper, the tone of the photographs being excellent. We understand that the demand for these Memorial pictures has been almost unprecedented in the history of commercial photography.

### York's Catalogue of Magic Lantern Slides.

Year by year Mr. F. York's catalogue of magic lantern slides becomes more and more plethoric. Since we last noticed this work it has received numerous additions, among these being a large number of views of the *Temples of Mysore*, from negatives by Colonel Henry Dixon. The illustrations are taken from Mr. S. C. Hall's work, *An Old Story*, and Mrs. S. C. Hall's *Boons and Blessings*—both of them being works written in the interest of the temperance movement. In these days of Arctic expeditions Mr. York's slides of the *Arctic Regions* will prove highly interesting, while the *Overland Expedition of Captain Franklin, Parry's Second Voyage, Relief Expedition in Search of Franklin, Expedition of Captain Ross to the Antarctic Regions*, and *Sir Edward Belcher's Expedition*, with numerous other subjects of current interest, are all new.

As a useful adjunct to the slides manufactured and published by Mr. York that gentleman has issued with them a series of *Lantern Readings*, each consisting of a short lecture descriptive of the special set of slides which it is intended to accompany. Among these we may mention *From London to the Falls of Niagara, A Walk in the "Zoo," Mysore, The Travels of the Sultan Ragobago*, and others, all characterised by conciseness of style and clearness of description, and having direct reference to the picture which is being presented to the audience.

We have hinted at the great addition made to the previously large stock of subjects published by Mr. York. Of the quality of the slides it is quite unnecessary for us here to speak. We have in previous years said that, in respect of purity, sharpness, brilliancy, and excellence of tone they have never been surpassed. These are still their characteristics, to which we may now add that, judging by the specimens in our possession, they have never shown the slightest indication of fading—neither light, heat, nor time apparently producing any effect upon them. The number of transparencies produced by Mr. York is equal to a thousand per week, and this fact testifies to the estimation in which they are held.

### A History and Handbook of Photography.
### By Gaston Tissandier.

London: Sampson Low, Marston, Low and Searle.

When the public is presented with a new treatise on photography by a French author it naturally expects to find in it a somewhat larger share of the honour of invention accorded to Gallic *savants* than it would in a similar case were the work by an English author. Let us do M. Tissandier the justice of saying that, while affording much information concerning the early history of photography, he has done so without advancing anything militating against such claims as may with all fairness be made for the part taken in the great discovery by our own countrymen. In the very few instances where any information of this kind seems to be withheld, it is promptly supplied as a footnote by the editor and translator, Mr. J. Thomson, F.R.G.S., who is himself an accomplished photographer and well acquainted with the history of our art-science. Hence it is matter for congratulation that the work of M. Tissandier has been entrusted to such competent hands.

The historical portion of the work is replete with interest. The circumstances under which Daguerre and Niepce commenced their relations is graphically narrated as follows:—

"In December 1825, he told everyone who would listen to him that the great problem was at last solved. 'I have seized the light,' he cried with enthusiasm; 'I have arrested its flight! The sun himself in future shall draw my pictures!'

"A few days later, in January 1826, he called on Chevalier to talk of his favourite subject. 'Besides the young man I spoke to you about' said the optician, 'I know a person in the country who flatters himself that he has obtained the same result as you. He has for a very long time occupied himself with reproducing engravings by the action of light on certain chemical agents. Perhaps you would do well to put yourself in communication with him.' 'And what is the name of my fortunate rival?' demanded Daguerre. Chevalier wrote a few words on a piece of paper, which he handed to Daguerre. On it was this address—'M. Niepce, propriétaire, au Gros, près Châlons-sur-Saône.'

"A few days afterwards Daguerre addressed a letter to this stranger, which the latter, with provincial mistrust, threw into the fire as soon as he had read, contenting himself with murmuring between his teeth—'There is another of those Parisians who would like to pump me!' It was under these auspices the relations between the two inventors commenced; they were, however, later on to unite their labours to create, as it were in common, an art which will be looked upon for centuries to come as one of the prodigies of our epoch."

In this pleasant manner are we treated to a most excellent *résumé* of the early history of photography, in the course of which the labours and inventions of all the photographic pioneers are passed under review. But to historical matter one part only of the work is dedicated—a large portion of the volume being devoted to practical details connected with the art, commencing with the construction of the studio and of the dark room and its fitings and appliances. The production of negatives by the wet collodion process, as well as by dry processes, is fully treated, as also the methods of printing in silver, in carbon, and by the mechanical processes, including the collotypic or heliotypic methods, by the Woodbury process, or "photoglypty," as it is here designated. Special chapters are also devoted to photomicrography, to the production of photographs in colours, to astronomical photography, to the stereoscope, and to the other applications of our art.

The volume is copiously and beautifully illustrated by woodcuts, several of them of dimensions occupying a full page. It is also embellished with a charmingly-executed frontispiece—a portrait of a young lady, printed by the "photo-tint" process of Messrs. B. J. Edwards and Co. The work should find a place on the shelves of every photographer's library.

### The Sciopticon Manual.—Third Edition.

In the new edition of the *Sciopticon Manual* Mr. Walter B. Woodbury, its author, has added very much of an interesting nature, especially a most suggestive article by Mr. Coleman Sellers, the President of the Franklin Institute, and formerly our American correspondent, in which that gentleman offers several suggestions concerning scientific experiments which may be made and exhibited by aid of the sciopticon without extensive appliances. This edition also contains an article on the production of glass positives for the magic lantern by Mr. John C. Browne, and a list of chemical experiments that may be perfomed in a small tank adapted as a lantern slide, by Mr. Woodbury himself, who also contributes numerous other hints to aid in rendering the sciopticon a fertile source, not merely of amusement, but of instruction. The work is lucidly written and copiously illustrated.

### Masks and Discs.

London: Mann and Fursman.

The beauty and effect conferred upon a photograph by the judicious use of oval or other masks, for protecting or tinting the margins, is so thoroughly recognised by practical photographers as to require no necessity for pressing it on their attention. The variety of shape and perfection of outline to which these masks have been brought can scarcely be surpassed. This is especially true with respect to a series of masks we have received from Messrs. Geo. A. Mann and Fursman, of London, than which nothing can be finer, the forms being so symmetrical and the edges so perfectly clean. The value of these will be instantly appreciated.

Having recently been shown over the factory of Messrs. Mann and Fursman, we might be expected to say a few words concerning the methods employed by that firm in the production not only of these masks, but also of *passe-partouts* and mounts, in connection with which they are justly celebrated; but such description would possess an interest for only a limited number of our readers. We greatly admired the dexterity with which the young females of the establishment applied the gold adornments by which the beauty of a mount is so much enhanced; and it elicited from us an expression of surprise when it was convincingly shown that the construction of special appliances and punches for one kind of mount alone involved an expenditure of twenty-six pounds before the first specimen could be produced—this, of course, quite independent of the screw presses and other tools in ordinary use. Our brief visit inspired a degree of respect for photographic mounts we had never before experienced.

# Meetings of Societies.

## EDINBURGH PHOTOGRAPHIC SOCIETY.

An ordinary meeting of this Society was held in the Hall, 5, St. Andrew-square, on the evening of Wednesday, the 1st inst.,—the President, Dr. Thomson, in the chair.

The minutes of the previous meeting having been read and approved, Messrs. James Gordon, M. Macgregor, D. Taylor, D. Cuthbert, G. F. Blaikie, M. P. Galloway, H. Hislop, J. Oswald, F. P. Moffat, and J. Macfarlane were admitted ordinary members.

The President said that before commencing the ordinary business of the evening he thought it right to inform the members present, and through them the Society generally, that at the instigation of Mr. Asher the Council had had under their consideration the desirability and practicability of getting up an exhibition of photographs which should be open during the latter end of this and beginning of next month; but after several meetings had been held and certain inquiries made it was considered best to postpone the effort for another year, partly from financial considerations and partly because by the short notice possible contributors here would be taken at a disadvantage. It had been resolved, however, that immediate action should be taken with the view of organising such an exhibition, to be opened in December, 1876, on a scale not hitherto attempted in this part of the country. He (the President) thought from the way in which it was intended to carry out the arrangements for the proposed exhibition it would in all probability be a paying concern. It would be evident to the members that the Society must be protected from any possible loss, and for that purpose a guarantee fund must be subscribed. He was pleased to be able to inform them that a good beginning had already been made in that direction, Mr. Davies having just informed him that a sum of over seventy pounds had been subscribed by a very few friends. Before the exhibition had been spoken of it had occurred to him that some of the surplus funds of the Society might be well spent in the purchase of high-class photographs for the album, where members might have an opportunity of studying them, and from which they could not fail to derive considerable benefit; but probably the object might be better attained by throwing their energies into the work of getting up the proposed exhibition.

Mr. A. Asher then read a paper on *Exhibitions a Stimulus to Advance True Progress in Art-Photography.* [See page 592.]

The President thought that the members were much indebted to Mr. Asher for the lucid manner in which he had brought the claims of the exhibition before them. One great object of photographic societies was the furthering of true progress in all departments of the art; and he had no doubt that the tendency of exhibitions was to show what was doing in all parts of the country, and by drawing out the best work of the best men they would be enabled to see exactly how far they were behind.

Mr. W. Neilson said he highly approved of the President's suggestion to apply some of the Society's surplus cash in the purchase of first-class photographs. He held the belief, which was now widely entertained, that exhibitions, instead of elevating the public taste, rather trained artists down to suit the popular demand. He would not support the proposed exhibition, as, instead of being a collection of *bonâ-fide* photographs, it would consist, to a large extent at least, of retouched productions. No doubt prints of that school sometimes showed that the negatives had been painted with much skill; but in a general way, in spite of their being imposingly styled the "higher art," he could not help regarding them with extreme dislike. An exhibition of untouched photographs would, he thought, be of much benefit, and it would receive his hearty co-operation; but such an exhibition as that now proposed he could not support. Mr. Asher, he thought, had missed the true point in his paper, which he considered to be the fact that a large and imposing exhibition would, if it became popular, set the public talking, and by increasing the interest in photographs give a much-needed stimulus to photography as a business.

Dr. John Nicol agreed with almost all that Mr. Asher had said, and had no doubt that from the zeal which he had infused into the Council the proposed exhibition would prove a triumphant success. He was glad the question had been raised in such good time, as, while it would let photographers in all parts of the world know that they were invited to send pictures to Edinburgh, it would stimulate the members of the Society to greater care in the work of the coming season, as they would always feel that each negative that was being developed might be worthy of a place in the exhibition. There was one portion of Mr. Asher's paper, however, to which he must take exception, namely, that in which M. Adam-Salomon's pictures were said to be "simply perfect." The Society, he thought, could hardly let that go forth as the opinion of the members without some qualification. It seemed to him necessary to distinguish between a perfect photograph and a picture that had been made what it was by other than photographic art. Now it will be remembered that when M. Salomon's exceedingly-beautiful pictures first made their appearance in England there was much diversity of opinion as to whether they were purely the result of photography or whether they did not owe much of the beauty to skilful touching up; and that, with a view to set the question at rest so far as the print was concerned, a fine copy was brought to one of the meetings, and in the presence of the members removed from its mount and washed with a sponge, the result being the removal of such a quantity of colour as to leave the print in a very different state from that in which it originally was. No one, he (Dr. Nicol) continued, could admire the pictures of M. Salomon more than he did; but he held that a picture which depended for much of its beauty on the skilful application of the artist's brush was not correctly described by the title of a "perfect" photograph.

Mr. Bashford fully endorsed Mr. Asher's sentiments, as he believed that an exhibition properly managed could not fail to benefit all concerned. He had no sympathy with the views held by Mr. Neilson, and hoped that the exhibition would not be one of photographs pure and simple, but of photographs finished by an artist of sufficient skill to supply the deficiencies of an imperfect instrument, which the camera undoubtedly was. He admired the works of M. Salomon very much, and, although they might in some cases be largely worked up by the brush, he had one in his mind's eye that had been vastly improved by skilfully-directed pencils of light being made to act on the print. He attributed the present high position of the photographic art mainly to the admirable example set by M. Salomon. People, he (Mr. Bashford) said, would not accept the hard, untrue pictures as produced by the camera alone, and he had no doubt that the public would continue to insist on the necessity for the restoration by the artist of that which the camera took away.

Mr. W. H. Davies said that the question under discussion was no question of trade. It was simply—What can photography do for art? and the exhibition was intended to answer that. It would show, not that photography was indebted to art, but that art was indebted to photography, and the two should come together as twin sisters. He thought Mr. Neilson was a little too strong in his condemnation of retouching. There was hardly a negative that might not be improved by a skilful application of the pencil or the brush, and he could see no reason why they should not accept the aid of their hands in making the

improvement. That photography could be made to produce very high-class work was abundantly evident from the work of the late Mr. D. O. Hill in the album now on the table; but that was no reason why it should not, if possible, be improvod by a resort to any and every means by which it might be done.

The PRESIDENT said that retouching might be done by chemical as well as mechanical means, and instanced the practice of the late Mr. W. D. Clark, who was in the habit, when developing his collodio-albumen plates, of protecting such portions as were sufficiently intense by a coat of varnish, and returning the negative to the developing solution. This was repeated again and again, in some cases as many as twenty times, until he had got every portion of the negative to his satisfaction.

Mr. DOBBIE thought they were wandering from the question, which was—Are exhibitions calculated to advance, foster, and encourage art in photography? Pictures of a high-class had been and were being produced by the aid of photography, and he maintained that the photographer was entitled to manipulate in any way he chose for the production of that which would best please his employers. He called in question the truth of Mr. Neilson's statement in regard to exhibitions generally, and believed that they had accomplished much good. Frequent visits to annual exhibitions of paintings enabled men to become no mean judges of the merits of a picture, and a similar result would undoubtedly be the effect of an annual exhibition of photographs. He held that their Photographic Society would be fully justified in organising such exhibitions, and inviting all the people in the country to come and be educated. It was a well-known fact that numbers of the best workers were in the habit of going to London purposely to see the annual display there; and they generally came back full of praise of what they had seen, and were always better for having had before them something high at which to aim. One of the first fruits of such an exhibition was the higher education of the photographer himself, and through him his customers also became elevated in their tastes. By attempting a high-class exhibition they would be trying to raise the standard of photography as an art in Scotland, and therefore he thought the sympathy of the meeting should be with Mr. Asher, and hoped the Society would go heartily into the undertaking.

Mr. ASHER, in reply, said that he remembered something of the dissection of M. Salomon's picture mentioned by Dr. Nicol, and he thought at the time, and still thought, that it was subjected to cruel treatment. He had twice visited M. Salomon in Paris, had been permitted to examine his negatives and method of working, and could assure the members that nothing more perfect had ever been produced. With regard to missing the point of his subject, as had been stated by Mr. Neilson, he most distinctly maintained that he had not. That the stimulus to public interest in photography given by an exhibition was likely to give an impulse to photography as a business he considered quite possible; but he thought that a very low view to take of the subject, and if there were no higher object to be attained he for one would have nothing to do with it. But, aside from that, if Mr. Neilson had looked at the title of his paper he would have seen that his object was to show the effect of exhibitions on art, and not on photography merely as a profession. No doubt the professional photographer was under the necessity of giving a certain amount of attention to the commercial department of his business; but he believed that the more his mind was given to the commercial the less likely was he to attain eminence in the artistic, and he had no doubt that the converse of this was equally true.

Mr. W. NEILSON then brought before the meeting a safety-dipper, the invention of Mr. Smith, of Bedford. It had the twofold advantage of non-liability to break and the impossibility of the plate slipping off. The dipper might also be used as a holder for coating or developing plates. It was made of hard wood, and in form like the letter Y with the lower leg elongated. On the two upper legs, which form the lower end of the dipper, are two pins on which the plate rests, and along the long leg, which forms the handle, was cut a groove; a strip of wood is dovetailed into this groove, and slides easily up and down. The plate is placed on the two pins, the sliding piece pushed down, and, as it has a notch on the end which fits on to the edge of the plate, the latter cannot be removed until the slip is pushed up again. Mr. Smith stated that he soaked the dipper for some hours in an old bath, after which it might be used without fear of injuring the silver solution, and that he had one in constant use for fifteen years. The dipper was examined with much interest, and the design very much admired.

Mr. DAVIES said that Mr. John Thomson, when in China, had broken his only dipper, and made one by tying together three pieces of bamboo in the form of a triangle with two long sides, and had used it satisfactorily through his whole campaign. Some time ago he (Mr. Davies) had made one in a similar way, but it had thoroughly "bamboozled" him, as it had so injured the bath that no amount of permanganate of potash was sufficient to remove the organic impurities which it had acquired.

Mr. BASHFORD suggested ebonite as a suitable material for its construction, and had no doubt that it would be found a very popular tool. In the absence of ebonite he recommended that the wood should be strongly heated and then dipped in melted paraffine, which he knew from experience would render the dipper perfectly harmless.

Dr. NICOL thought the dipper the best he had seen, and would have one made at once, as he had often felt the annoyance of a plate slipping off and the glass dipper getting broken under circumstances where it was not easily replaced. He (Dr. Nicol) then laid on the table a large number of photographs—a portion of his work during the season—and said that at the last meeting, when in consequence of an invitation in the billet a number of the members had brought their summer's work for inspection, he felt that the time at their disposal did not admit of anything like a proper examination or of any discussion on the merits of the productions. He then suggested that, instead of all the members' work being shown on one evening, a single member only should exhibit his pictures and invite criticism. In this way ten minutes at the end of each evening might be profitably employed, as, if the more experienced of the members would only speak out freely, pointing out the faults and suggesting improvements, much valuable information would be elicited. He (Dr. Nicol) then handed the pictures round the table; but, although many were ready with praise of several of them, considerable difficulty was experienced in getting up the kind of criticism courted.

Votes of thanks were given to Mr. Asher, Mr. Smith, and Dr. Nicol, and the meeting was adjourned.

# Correspondence.

## "THE DISCOVERIES OF MR. M. CAREY LEA."

*To the* EDITORS.

GENTLEMEN,—Colonel Wortley's first sentence in his last letter accuses me of finding fault with discoverers generally, whereas what I have been trying to do is just the reverse of this—bestowing a timely good word in favour of Mr. M. Carey Lea, who has so generously given the readers of this Journal the benefit of his discoveries, without keeping anything in the background to receive pecuniary benefit from and tamper the progress of those who are trying to carry out and verify his experiments. No man has been more generous with his information than Mr. Lea, and few, I imagine, are more highly esteemed by emulsion workers than that gentleman.

It is *not* a crime for Colonel Wortley to use gum arabic as a preservative for dry-plate work. What does Colonel Wortley wish me to say? That I am much obliged to him for keeping the secret to himself? Let him tell the readers of this Journal how *they* may do it, and I, amongst others, will show my respect and appreciation in a becoming manner.

Respecting the *suitable* pyroxyline of Colonel Wortley's—another discovery according to his own statement—does he intend making known his formula for manufacturing this *suitable* pyroxyline to which he has so often *referred* to only? If it does not land us in the middle of the photographic *millennium* it will, at least, help us to a more advanced state of dry-plate workers; that is, if Colonel Wortley's statements of its virtues can be verified by his imitators. This will, I am sure, call forth a proper measure of respect for that gentleman, in which I shall be happy to lend my small and unknown voice to chant his praise as a *true* discoverer and benefactor.—I am, yours, &c. JOHN HOWARTH.

111, *Thornton-road, Bradford, December* 7, 1875.

## HEATING BY GAS.

*To the* EDITORS.

GENTLEMEN,—In my former communication on the above subject, wishing to be brief, I omitted the details of the gas fire. In answer to "Dunham," permit me to say that a five-eighth-inch pipe was taken direct from a large meter to a stove of moderate dimensions. Occasionally in the day time the pressure from the mains was so light as to cause the gas to ignite at the burner below, thus losing the advantage of a mixed gas and air burner or blow-through having a tube screwed over the burner so as to mix the gas with common air below and ignite it at the top, a couple of these being placed suitably for playing effectually on asbestos placed in the grate in lieu of coal. However, I now am reminded that the difficulty of igniting below was overcome by my inserting gauze netting within the tubes of the burners. I shall be glad to hear if a better method can be adopted.

The simple expedient I described to obtain heat has the same great objection gas stoves have, unless proper precaution be taken to carry off the noxious gases. On entering a room where even a properly-constructed gas stove is in use our sense of smell can detect the polluted atmosphere.

Regarding the cost of using gas fires and gas stoves, my experience is borne out by the number of those appliances excommunicated after the visit of the surveyor of meters, or when the gas account was received, to the amazement of the consumer.—I am, yours, &c., S. S. C.

*Ulverston, December* 6, 1875.

PORTRAIT PAINTING.—A rather puzzling question sometimes arises in connection with portrait painting. If the so-called portrait, as happens often enough, be little better than a caricature, the unlucky person who

sees his features misrepresented thinks it very hard to pay for what he dislikes. On the other hand, the artist may reply that he never undertook to produce a "speaking likeness," but only promised to do his utmost; and if the result be not satisfactory, it is at any rate the best his skill can produce. Besides, people are apt to have a rather exaggerated idea of their own good looks, and a very honest portrait may appear to them shamefully untruthful. A case has come before Sheriff Smith at Greenock which very well illustrates such difficulties. Mr. Roxburgh, a portrait painter in Glasgow, was commissioned by Mr. Fergus, a photographer in Greenock, to paint a portrait of Mrs. Fergus from an enlarged photograph. The work was executed and charged ten guineas. This sum Mr. Fergus refused to pay, declaring that the painting was no more like his wife than "night was like day." An action was raised, and the sheriff, in order to effect a peaceful solution, advised that the portrait should be improved. Mr. Roxburgh, instead of simply improving his work, painted a new portrait. The inexorable photographer was, however, still discontented, and declined to come to terms. The sheriff, unwilling to arrive at a hasty decision, submitted the matter to "two eminent artists from Edinburgh." These gentlemen were of opinion that the picture was a good work of art, a skilful copy of the photograph, and a good portrait, and that the price was a fair one." In accordance with this judgment a decree was given for the ten guineas and expenses, which amounted to more than that sum. But suppose the "two eminent artists from Edinburgh" had thought otherwise. Would it have been quite fair to decide in favour of Mr. Fergus? If so, half the portrait painters in the kingdom would have little chance of being paid for a very large proportion of their achievements.—*Globe.*

## EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale,* that being done at the small cost of one shilling in our advertising pages. This column is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

Spencer, Sawyer, Bird and Co.'s autotype apparatus, cost £12, will be given in exchange for a good dark tent on wheels, or good half-plate camera and lens, or other photographic articles.—Address, R. Iliffe, Hinckley.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

F. Goldie.—The patent expired in 1872.

J. M. (Coventry).—Thanks for the suggestion, but it arrived too late to enable it to be acted upon. We shall keep it in mind.

W. K.—By immersing a plain albumenised paper print in a solution (very weak) of Judson's dyes you will be surprised at the beauty and variety of tones which may be obtained.

Nemesis complains of his bath being supersaturated with iodide of silver, and asks for a remedy. Let him add a little distilled water, by which a precipitation of iodide of silver will take place. Remove this by filtration, and then add enough nitrate of silver in crystals to bring up the solution to the required degree of strength.

Albumen (Weymouth).—There are two methods by which enamels may be produced—one by the dusting-on process as detailed in former Journals and Almanacs; the other by the transference of a toned collodion transparency. Both these methods are fully described in a manual recently published by Mr. Solomon, of Red Lion-square.

Bainbridge's Tent.—Respecting the notice of this tent in our issue of last week, the inventor, Mr. J. T. Bainbridge, observes:—"You say it has one cover of black and one of yellow, whereas it ought to have been *two covers of best black twilled calico and one of yellow;* for I have found that a tent with less than this number of covers is not to be depended upon in full sunlight."

S. S. K.—Owing to the careless manner in which your letter is written we do not know whether you mean *alcohol* poisoning or *alkali* poisoning; but it is so very seldom we hear of the former substance being employed as a poison that we shall assume it to be the latter. The general treatment for cases of alkali poisoning is to administer copious draughts of weak vinegar, tartaric or citric acids, the solutions being, of course, very weak; lemon or orange juice may also be given with good effect, and so may large draughts of milk, gruel, or linseed. Some recommend the giving of large doses of oil for the purpose of converting the alkali into soap and inducing vomiting.

C. B. A.—Seeing that you have not an equatorial mounting for the telescope, the only way by which it can be utilised in the production of a photograph of the moon is to fix it rigidly, its object-glass directed towards a plane mirror made of silvered glass, that mirror being suspended between trunnions like a "bedroom looking-glass," capable of allowing it to be tilted in any direction. The stand supporting these trunnions must rotate by clockwork upon a level surface. When, by means of such a mirror, the moon is reflected into the telescope, if the clockwork be then started the image of the moon will remain stationary upon the sensitive plate for the time necessary to enable a suitably-impressed negative to be taken.

B. J. W.—Bromide of cadmium is readily soluble in either alcohol or water; bromide of potassium, on the contrary, is very sparingly soluble in alcohol, although it dissolves readily in water. The weaker the alcohol the larger is the proportion it retains in solution.

G. B. Duncan.—The matt apparance in your Ferrier slides for the stereoscope is owing to their being coated with a particular kind of varnish in which wax forms the principal ingredient. To remove it apply heat sufficient to melt the wax, afterwards wiping the surface with a soft cloth. There is no fear of the picture being injured by this treatment; for, being printed on albumen, the surface is very hard—sufficient, at any rate, to resist friction with a cloth. By this treatment the stereoscopic slide will be rendered transparent and suitable for being exhibited in the lantern, subject, however, to one objection, viz., slides developed for the stereoscope are invariably too deep and intense for the lantern. For this there is but one remedy, and that is copying them, which, on moral grounds, we cannot advise you to do.

V. R. (Fulham Road).—This correspondent wishes to be informed in what way the scratching of a lens will affect a picture. It is a matter of dispute, he says, between himself and two other photographers, and they have agreed to refer the matter to us and abide by our *dictum.* This we unhesitatingly give as follows:—A scratch on the surface of a lens—a portrait lens, for example—will affect the rapidity of its action only in proportion as it prevents the light from being transmitted, and this *practically* amounts to nothing unless the scratch be very wide and have very jagged edges; so much for its rapidity being affected. It will not affect its defining power in the slightest degree. There is a chance, however, that the jagged or fractured edges of the scratch, if such exist, may be the cause of the admission of a small amount of diffused light into the camera—enough, in an aggravated case, to cause a loss of brilliancy in the shadows. By painting over the scratch with a very fine camel's-hair brush charged with black varnish or China ink this diffusion of light would cease.

Don Cæsar.—The alcohol is not deleterious; for, although it is one of several substances by which albumen may be coagulated, it exerts no further action on that body after it has been coagulated. Again: alcohol does not exercise any deleterious action upon the substance of which the print itself is composed, and it must be borne in mind that it evaporates very rapidly. Methylated alcohol does not necessarily contain any gum or resinous body; the liquid known as "finish" certainly contains a little, although not enough to exercise any influence upon the gelatine. The gum is added to enable certain tradesmen to vend it without having a licence for doing so; but there is scarcely a town of any importance in the United Kingdom in which methylated alcohol cannot be obtained free from gum. Our correspondent says, in his note, that he has used for some time and with much satisfaction a mixture for mounting prints, which "keeps" excellently. It is composed of gelatine, Brown and Polson's flour, distilled water, and carbolic acid; but the great drawback is that the gelatine appears to separate itself from the rest after a time and resolve itself into one solid mass, leaving the rest as a sort of liquor around it.

Received.—Professor E. Stebbing; H. J. Newton. In our next.

☞ Editorial Communications should be addressed to "THE EDITORS"—Advertisements and Business Letters to "THE PUBLISHER"—at the Offices, 2, York Street, Covent Garden, London, W.C.

South London Photographic Society.—The annual dinner of this Society will take place at Anderton's Hotel, 164, Fleet-street, on Saturday, December 18. Not being confined to members only other photographers and friends can be present. Further particulars may be obtained from Mr. Edwin Cocking, Honorary Secretary, 57, Queen s-road, Peckham.

The Photographic Society of Great Britain.—The next meeting of this Society will take place at 9, Conduit-street, on Tuesday next, the 14th inst., at eight o'clock p.m., when Mr. Viles will read a paper *On the Manipulation of Large Plates in the Field.* On January 11, 1876, Colonel H. Stuart Wortley will read a paper, the subject of which will be announced in due course.

## METEOROLOGICAL REPORT,

*For the Week ending December* 8, 1875.

Observations taken at 406, Strand, by J. H. Steward, Optician.

These Observations are Taken at 8.30 a.m.

| Dec. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks |
|---|---|---|---|---|---|---|---|
| 2 | 29·90 | NE | — | 33 | 35 | 30 | Snow |
| 3 | 29·92 | NE | — | 32 | 36 | 30 | Dull |
| 4 | 29·93 | NW | — | 30 | 33 | 28 | Foggy |
| 6 | 30·11 | NE | — | 31 | 34 | 26 | Snow |
| 7 | 30·42 | E | — | 31 | 36 | 29 | Snow |
| 8 | 30·41 | NE | 35 | 36 | — | 30 | Dull |

CONTENTS.

THE BRITISH

# JOURNAL OF PHOTOGRAPHY.

No. 815. Vol. XXII.—DECEMBER 17, 1875.

## TRANSPARENCIES UPON PAPER.

In the course of our recent article upon the production of transparencies upon glass we had intended making reference, casually, to the above subject, but want of space prevented us upon that occasion doing the subject justice. A few words of explanation should be given for the benefit of those who fail to see the utility of paper transparencies, so called, or their advantage over glass ones. As regards any advantage in point of beauty we must at once say that none such exists; but, as regards utility, we shall attempt to show where the employment of paper deserves notice.

It is now many years since we first saw paper transparencies, and the novelty of the idea, combined with the effect produced, at once struck us. Visiting a photographic friend, who resided in a country place beyond the reach of gas companies, our attention was at once attracted by the lamp-shades upon the table. These were of the usual description, being made of the ordinary enamelled cardboard; but the novelty consisted in the shades being perforated by three or four apertures at intervals in the circumference, each aperture containing a charming little picture, evidently a photograph, but how produced we were quite unable to decide on the first hasty glance. The question was eventually put to our host as to how the pictures were produced, and we were much astonished and, perhaps, slightly sceptical when he replied—"Oh, that's the way I use up my over-printed and spoiled stereos." A closer observation proved such indeed to be the case; and, after listening to the description of the whole method, we resolved to take a hint ourselves.

The foregoing is only one instance out of the many applications which will suggest themselves to any ingeniously-inclined photographer; and one of the charms of the matter is that no expense is attached to it, the result being gained by the mere outlay of a little time and the utilisation of otherwise worthless materials. There may be cases in which it will be worth while to take special care in producing this class of picture from new and good materials, and we shall, therefore, describe the *modus operandi* from beginning to end.

In the first place, the best results, when viewed as transparencies, are given by over-printed proofs, though a print of the ordinary strength will generally give a fair result; hence, in selecting from the waste prints, choose those, preferably, which have been rejected as too dark. The next thing to look to is the paper upon which they have been printed, whether Rive or Saxe. For small pictures the former is decidedly the better of the two, though the latter, by judicious treatment, may be made to yield results in every way equal. Examine the paper closely in order to judge whether it will require to be rendered translucent. If it should be a tolerably clear specimen of Rive this will not be necessary, a simple soaking in hot water being quite sufficient. After passing through the hot water the print, which should have been previously trimmed to the desired shape, is pressed between folds of blotting-paper, and while still damp mounted by means of starch paste upon its final support. This will, of course, be some form of "cut-out" mount, the print being attached thereto by the edges only. By being mounted in a damp state, while the paper is expanded to its full extent, it becomes, when dry, perfectly flat and tight.

After allowing the print to dry upon its mount it may undergo whatever further treatment may be necessary, such as colouring, varnishing, &c.—the former operation being always performed first, as the colours are then more manageable. These should be what are known as "transparent" colours, and may be applied either to the back or to the front of the picture. If the photograph be applied to such a purpose as to be required to be viewed by reflected as well as transmitted light the colouring should be done upon the front, unless it be desired to exhibit the contrast between monochrome and colour; in the latter case, and when the picture is merely to be viewed as a transparency, it will be better to apply the colours to the back of the paper. It is unnecessary here to give any detailed instructions in the art of colouring; but we may say that the manipulative skill involved is of the most meagre description, while by the exercise of a small amount of artistic feeling most charming effects may be produced.

After colouring the picture it may, if necessary, be varnished or rendered translucent. As we have remarked previously, this operation is not absolutely necessary, and is in some instances decidedly injurious. The instances where it will be found useful are when the paper used is of a coarse or granular texture, or when the printing has been carried to such a depth as to hide the detail in the shadows and darker parts. In such cases as the latter it is really wonderful how the application of a little varnish brings out detail which was never expected before its application. Various means may be employed for the purpose of thus rendering the paper translucent, but all are chargeable with the same defect, viz., that in course of time they cause the whites of the picture to turn yellow. The quickest, and perhaps the simplest, plan is to use wax, either rubbing the solid substance upon the print in contact with a hot plate or using it in the form of solution. Better than wax for this purpose is, perhaps, paraffine.

Another varnish, which has hitherto given very satisfactory results in our hands, consists of a solution of Canada balsam in turpentine. The sample of balsam should be as fresh and colourless as possible, and the solution very thin; to each ounce of it add from three to six drops of castor or almond oil. This is applied by means of a brush and allowed to dry spontaneously, when it will be found to have acquired an extremely textureless appearance. The varnish should be so thin as to require a double coating to produce the full effect; by this means a more even coating is obtained, while, at the same time, it enables us to give to some pictures a greater amount of transparency than others according as they may require it. A little ingenuity also enables the operator to represent sun and moonlight effects, night scenes, illuminations, &c. The sun, moon, or stars can be represented by making perforations in the desired positions on another piece of paper which is mounted behind the picture. Rows of lamps, as in street scenes at night or illuminations, merely require the picture itself to be pricked with the point of a pin when necessary. Many simalar effects will, doubtless, suggest themselves, and, though, scarcely coming within the bounds of photography proper, will, doubtless, afford amusement to some of our readers.

Amongst the uses to which these paper transparencies can be applied we may mention lamp-shades, fire-screens, lanterns,

stereoscopic slides, and we have even seen them used in window decorations. The directions we have given, though but brief, will be sufficient to enable any of our readers who may think it worth while to follow out this branch of photography, and probably to improve greatly upon the ideas contained in this article.

## THE APERTURE OF THE DIAPHRAGM.

The Photographic Section of the American Institute is a body the report of whose transactions we at all times read with much interest. We may not always agree with all that is said, but we invariably feel assured that their utterances are those of men of ability and earnestness. At the September meeting of the Section, among other topics brought forward for discussion was one on the shape of the aperture in the diaphragm of the lens; and, irrespective of the opinions of those who spoke on the subject at the meeting to which reference has been made, we shall here present a few remarks of our own.

It is an idea cherished by a considerable number of photographers that, in some way or other, the shape of the aperture in the diaphragm exercises an influence, more or less marked, upon the quality of the picture to be taken. Some imagine that a square-shaped aperture in the diaphragm of a portrait or similar combination is the proper form, because the picture is of a square shape. Others imagine that when a tall object, such as a church spire, is to form the subject of the photograph the aperture in the diaphragm should partake of a similar shape, and be in the form of a slit rather than of a circular hole. In like manner there are some who think that an extended or panoramic view is best rendered by a slit placed horizontally; while still another section imagine that all ends are met by a compromise between a slit and a circular aperture, one of the latest of these that we have seen consisting of a circular hole having a Λ-shaped piece cut out from its upper side, the object being, as we were informed by the photographer from whom it was received, to ensure the better lighting of the foreground than of the sky!

Now these opinions have not been put forward exclusively by persons comprised in the class of the mere tyro, whose knowledge or experience might easily be assumed to be not of a very enlarged character; but each of the forms named has had its sponsor among men whose names are well known. For example: the late Mr. O. G. Rejlander, when, several years ago, describing his experience with lenses at a meeting of the Birmingham Photographic Society, said:—"I find it sometimes an advantage to vary the form of diaphragm according to circumstances—either round, oval, oblong, or square. I frequently find it an advantage to cut a piece of cardboard somewhat to the shape of the image I desire, so that I cut off all the outside rays." Again: at a meeting of the London Photographic Society we have heard another eminent photographer advocate the use of a slit instead of a circular aperture.

These opinions and ideas are not sound in principle, and they cannot be shown to be good in practice, for theory and practice are never antagonistic. The shape of the picture is not influenced in the least degree whatever by the fact of the diaphragm in front of the lens being of a particular form. The circle of light out of which a square or oblong picture is cut will be circular and of no other form, even if the aperture in the stop were square, triangular, bottle-shaped, or circular. This also applies to the form of the diaphragm used between the lenses of a combination. So long as the back lens of a combination, or the single lens of a landscape objective, is round in shape so long will the field of delineation be circular. If it be required to cut off all light from the ground glass except that which goes to form a picture of certain dimensions—say eight inches square—the only way by which this can be effected is to interpose a square opaque diaphragm behind the lens, so as to render it in *effect* of a square shape.

The idea of using a keyhole aperture in the diaphragm arises from the notion that the intensity of the light from the sky will be reduced. Anyone who possesses the most rudimentary acquaintance with optics knows that it will not do so. The way we advise those not possessing such acquaintance with optics to proceed is to ascertain the matter for themselves, by placing the camera *in situ* directed towards the view which as respects its lighting is to be ameliorated by the stop of the peculiar form. Now remove the ground glass; throw a large focussing cloth over the head, and let the eye be placed where the ground glass was alternately in the position of the sky and the foreground. If such a stop really fulfilled the expectations of those by whom it has been recommended it will be seen that, when the eye is directed towards it from the position of the sky, it is seen to be equally as large, and of precisely the same form, as when it is examined from the foreground position of the view. No matter from what position it is examined it is seen to be of the same size and shape; and hence the pencil of light that is admitted to the sky of the view is quite as large as that transmitted to the foreground.

As regards the influence of an aperture of the slit form, let us briefly consider what is the function of a diaphragm. It is to cause the image upon the ground glass to be formed by a definite portion of the lens—the centre of the picture by the centre of the lens, and the sides by the margin of the lens. In a case where the greatest amount of sharpness is indispensable the condition just expressed must exist, for rays coming through the centre of the lens will not come to a focus at the same distance from the objective as those transmitted through the margin. The effect, therefore, of a stop or diaphragm with an aperture composed of a horizontal slit is to cause a serious mingling together, on the plane of delineation, of rays coming *both* through the centre and the margin of the lens, *i.e.*, of rays of long and of shorter foci, the sum total of which is an imperfect degree of sharpness.

By confining ourselves to a circular aperture in the diaphragm we obtain to the fullest extent the advantages of a diaphragm, and there is no simple stop that can be made by which we can secure such advantages to a similar extent. Stops which have the form of slits, keyholes, bottle-shapes, squares, or any other that whim may suggest or perverted ingenuity devise, are wrong both in theory and in practice. As we have already said, when the eye is placed in the position of the ground glass the key-hole or other stop is seen represented *as* a keyhole in its entirety; on what principle, therefore, may we inquire, can it be assumed that any one portion of the image will be illuminated by a larger or smaller pencil of light than another?

The best form of aperture is, therefore, a circle—as carried out in practice by our opticians.

## A PLEA FOR EXACT OBSERVATION.

Until comparatively recent times there was, even amongst skilled photographers, a pretty general belief that, although dry plates could be made to yield good results with little trouble and tolerable certainty, they were not capable, even under the most favourable circumstances, of giving negatives of the high degree of excellence which could be obtained on a wet collodion film.

There is little doubt that from the nature of much of the dry-plate work then shown there was considerable justification for the opinion hinted at above, and it was hardly possible that it could be otherwise. Professional photographers were pretty well satisfied with the power which wet collodion gave them, and devoted their attention more to the improvement of the art-aspect of their productions if they had an ambition to rise above the merely mechanical or to doing the greatest possible quantity of work in the shortest possible time if the making of money were their only object.

Thus it was left to the amateur, with little leisure, less experience, and frequently with only very limited powers of observation, to introduce and work out a process by which photography in the field became possible without a cumbrous and troublesome array of apparatus and chemicals. Of course we do not mean it to be understood that dry-plate work, even at its commencement, was altogether left in the hands of the inexperienced amateur, but only that it was so to such an extent that the results shown by them were largely in excess of those by more experienced workers; and as they were, in too many cases, under-exposed and improperly developed they failed for a long time to attract the attention they deserved. There was, however, a charm about the idea of producing landscapes without the

encumbrance of the usual *impedimenta* that induced even the most unsuccessful to persevere; and what with the fairly uniform results of the experienced few, and the occasional and perhaps accidental successes of those with whom perseverance had to do duty for experience, dry collodion, in spite of much difficulty, became an established fact, and was proved, in the hands of those who had made themselves thoroughly acquainted with its peculiarities, to be capable of yielding pictures of great excellence.

At this stage of the history of dry collodion the ranks of those who had hitherto patiently worked it out were strengthened by the accession of several well-known amateurs, who not only brought to bear on the question a large experience, but also minds trained to systematic, exact observation. They threw their whole energies into the subject both as regarded its theory and its practice, and communicated the results of their observations so freely and fully that, amongst amateurs at least, the nature, properties, and peculiarities of dry plates generally are quite as well understood as are those of wet collodion, while the actual results, as regards the quality of the negatives produced, are at least quite equal; and we think it will be generally conceded that, under certain circumstances and for certain purposes, they are better than, by any known method of working, wet collodion could be made to produce.

Where so many different minds have been at work in one particular direction it is but natural that the desired goal should have been sought by many different roads, and therefore there have been introduced more so-called processes than we could readily call to mind. For practical purposes, however, they may be all included under three heads—the dry collodion, in which a plate sensitised in a bath and washed is coated with some organic matter; an emulsion of silver bromide in collodion; and an emulsion of the same material in a solution of gelatine.

By the first of these three processes much work has been and is being done, and negatives of the very highest order of merit are regularly made by those who thoroughly understand its manipulation. There are many thoroughly-experienced men, however, who believe that it has had its day, that the time is not far distant when it will give place to the second we have named, and that a washed emulsion will be the process of the future.

There are many reasons, we think, why this opinion should be regarded with favour. The emulsion, however intricate the formula may be, is really very easily made; it, in all probability, will be found to retain indefinitely its uniformly good quality; the preparation of the plates is extremely simple, and occupies less than a tithe of the time required in any other process; while last, but not least, the film, so far as microscopic observation is concerned, is, however much on *a priori* reasoning one may be disposed to argue to the contrary, absolutely finer than a film of iodide or bromide of silver formed in the bath. For these and other reasons we think that photographers generally would regard with much pleasure the idea of an universal adoption of the washed emulsion; but, great as is undoubtedly the success that has been attained in its practice, we believe there is yet a good deal to be done before it will supersede all other methods of working.

A little consideration will show that in reality an emulsion so easily made, and from which all foreign or unnecessary matter has been removed, should be more uniform in its action, and less liable to give varying results in the hands of different operators, than an indefinite mixture of both necessary and unnecessary matter; and yet a careful perusal of the journals for the last year will make it abundantly plain that quite as great a diversity of opinion and as wide a difference in the actual results prevail in this as in any other process.

Take, for example, the addition of iodide to the bromide emulsion, as recommended by our esteemed *confrère*, Mr. M. Carey Lea. He is probably one of the most careful experimentalists and exact observers at work on photography, and yet many, ourselves included, have failed to get the exalted sensitiveness which he found the addition to give. It will be seen that in our last number Mr. Lea suggests, as a probable cause of the want of success, that the emulsion was allowed to become too dry before washing. We, some time ago, made a series of experiments to test the effect of time allowed for the setting of the film before plunging the plate into the water, and we found that with emulsion containing an excess of bromide the sooner it was washed after coating the more sensitive it was, and that for every ten seconds it was allowed to set there was a corresponding loss of sensitiveness. With an emulsion in which the bromide was exactly neutralised there was absolutely no difference between plates plunged into the water after ten seconds and others that were allowed sixty seconds; while plates coated with a chlorised emulsion containing free silver seemed to be more sensitive when kept out of the water till well set. We have no doubt that the hint thus thrown out by our correspondent will be put to the test by many that are interested in the process, and, should it turn out as he expects, it will be another example of the necessity for, and the value of, the habit of exact observation which we have so often urged.

If, then, a washed emulsion is to be the process of the future, and there be still much work to do to bring about that desirable result, this, we think, is just the proper time to set about it. It will be too late to wait till the season for work comes round, and neither camera or daylight is needed. A good negative, an ordinary printing-frame, and a gas or paraffine flame are all that is required. With these, and a stock of patience and perseverance, the long winter nights may be spent not only pleasantly but with much profit; and if experiments are conducted systematically, and every observation carefully recorded, we have no doubt that by the advent of "sweet spring" much will have been done to solve the problem in which we are all so deeply interested.

The points on which information is more especially wanted are—the most suitable pyroxyline; the best bromides and iodides, and, if iodide be an advantage, the most suitable proportions; if it be an advantage to organify, and when; the simplest and most efficient mode of washing; how to dissolve the dried pellicle; and how to develope so as to get sufficient intensity combined with all other good qualities. For this purpose a constant use of the note-book is a *sine quâ non*—not only for the recording of what may seem matters of importance, but the entering of even the most minute and apparently trifling details, as all history shows that great effects have often had their origin in small causes, and that in photography, as in other matters, a grain at one end of a lever may move millions placed at the other.

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In his communication, last week, upon the subject of the chloriodo-bromide process Mr. M. Carey Lea makes allusion to the strength of pyrogallol when used in combination with an alkali for purposes of development. That substance has hitherto occupied a sort of anomalous position in connection with ammonia development, inasmuch as most writers, while varying the proportions of the alkali and the restraining bromide according to circumstances, invariably recommend a "three-grain solution of pyro." This is, to us, the more surprising, as, holding the opinion we do upon the action taken by the pyro. in bringing out the picture, it appears curious that when minor accessories are varied according to convenience the chief ingredient is inexorably fixed at a certain strength. When Mr. Lea published the details of his process, early in the present year, we were greatly struck by the small quantity of pyrogallol employed in developing, and after failing in getting sufficient density and vigour with our ordinary strength of solution (about three grains to the ounce) we followed Mr. Lea's formula, and found to our astonishment that the negatives developed cleaner, with greater rapidity and vigour, and easily acquired any amount of density. We had previously been of opinion that the subsequent density and vigour of a negative depended mainly, if not wholly, upon the strength of the pyro. solution used at the commencement, and we have heard a well-known authority on such matters aver that if the first developing solution employed be below a certain strength as regards pyro. it is impossible *by any subsequent means* to get vigour or density. Thinking that the effect produced in the new process might be owing to some peculiarity conferred by the addition of iodide to the emulsion, we tried the effect of the weak pyro. upon simply bromised plates, and found that, though the chloriodo-bromide

plates were capable of development with a weaker solution than the plain bromide ones, the same principle held good in both cases; that, in fact, where the exposure had been correct the employment of weak pyro. at the commencement, afterwards strengthened by further additions not only of alkali but also of pyrogallol, had the effect of greatly shortening the development, increasing the vigour of the image, and also gave the power of obtaining any desired amount of density. The strong pyro. appears to act too powerfully at first, bringing out the shadows before the lights have had time to to acquire a proportionate density, and rendering it necessary, in order to secure contrast, to employ a large quantity of restraining bromide. With the weak solution, on the contrary, the bromide may generally be omitted in the first application. For these reasons we endorse Mr. Lea's remarks of last week, and would advise a return to Major Russell's system of developing by means of an alcoholic solution of pyro. This we have always adhered to as a stock solution from which to make up the aqueous solution without the trouble of weighing. It keeps well, is always ready, and enables us to make successive additions of pyro. at the exact moment required.

## DEVELOPING NEGATIVES.

A past number of The British Journal of Photography contained a letter from Colonel Wortley, in which he kindly published his formula for making glycocoll, and claimed for a thirty-grain solution of iron, with the addition of glycocoll and formic acid, superior energy and quickness as a developer of the latent image.

Allow me to state that I have made some glycocoll according to the directions furnished, and tried the developer recommended against one I have been in the habit of using for extra-quick work, but my expectations of the result of Colonel Wortley's formula have not been realised. However, the developer possesses some excellent qualities, and it may be that I have not hit the right proportions of the glycocoll and formic acid for obtaining its full capacity, Perhaps that gentleman will be good enough to indicate them, or himself make a comparative trial of his developer with one made as follows:—

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|---|---|
| Protosulphate of iron | 1 ounce. |
| Acetate of lead | 1 drachm. |
| Water | 10 ounces. |
| Filter, then add— | |
| Sulphate of copper | ½ drachm. |
| Acetic acid | 1 ounce. |
| Water | 10 ounces. |
| Spirit | 1 ounce. |

This developer requires a shorter exposure than any I have yet used. In place of the acetate of lead an equivalent of ammonia may be substituted, only the precipitate, in that case, must not be filtered out.

The *acetate of iron*, in the absence of a free acid, suspends the developing powers of a solution of the protosulphate of iron if added to it, but greatly accelerates its power when acetic acid is in excess, as the following experiment shows:—Take about a drachm of the iron solution of the formula, after the sulphate of lead has been filtered out, and, being sure that it is not acid, add to it a few drops of a ten- or fifteen-grain solution of nitrate of silver. No precipitation will take place, but add a drop of acetic acid and the silver will at once begin to fall—more or less copiously according to the quantity of free acid present. If instead of acid a few drops of a solution of sulphate of copper be used, a similar effect is produced (as in my experiments I did not test the copper solution for acid, it may be that the precipitation of the silver was due to acid). Other acids besides the one named may be used in the experiment with like result. It is very interesting to note the variations of the colour of the precipitated silver as different acids are used, and to observe the opposite tendencies of the falling precipitate. With one acid it goes directly to the bottom of the glass, while with another it deposits on the sides of the glass and adheres.

I was lead to the foregoing experiments some years ago by the announcement of Mr. M. Carey Lea's hypothesis that the action of light on iodide of silver was of a physical nature, it occurring to me that, if light simply communicated to the iodised plate the power to attract the falling particles of freshly-precipitated silver on the parts where it had acted, then the smaller or finer the particles presented for attraction were the more easily would they be attracted, and consequently the shorter might be the exposure, since a weaker attraction for a small body would be equivalent to a stronger attraction for a larger body. This reasoning proved right, for I found that the combinations which produced the finest precipitate of silver were also the quickest developers of the latent image. I proposed to try whether or not the latent image could be developed by what is called "ruby gold," that being the finest metallic precipitate I could think of, excepting, perhaps, Mr. Malone's "ruby silver;" but falling ill I was unable to do so.

There was one other experiment which I tried about that time which is, perhaps, worth naming, because it seemed to prove that the action of light on iodide of silver must be of a chemical as well as of a physical nature. It was as follows:—I prepared a plate in the ordinary way and exposed it in the camera, having selected a white object to be photographed. I then immersed the plate in a strong solution of hyposulphite of soda until all the iodide of silver was dissolved out of the collodion film, and after washing well proceeded to develope with iron. The result was a weak but very distinct image of the white object. Another curious fact is that the photographic image can be perfectly redeveloped after being quite dissolved out, either before or after fixing, by means of Mr. M. Carey Lea's detergent diluted to about the colour of sherry wine.

I used the following developer some years ago, and found it a good one for very hot weather; it produces very clean, brilliant pictures requiring no redevelopment. The formula may probably be found useful to photographers in the tropics, for the warmer it is used the better and quicker it works. It is useless in winter if not made hot. There is one more good quality possessed by this developer—it does not change by keeping. Every operator knows that his developer is liable to lose its balance through the evaporation of its acetic acid; but the one here recommended will keep good in the hottest weather indefinitely:—

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|---|---|
| Protosulphate of iron | 1 ounce. |
| Sulphate of copper | ½ " |
| Water | 20 ounces. |

Wm. Hanson.

P.S.—I must apologise for the length of this communication, but having read the experiments of MM. Rottier and Waldack, and your own remarks on them, I thought the facts I have named might be of some interest.—W. H.

## ON THINGS IN GENERAL.

In my last notes I called attention to a sentence of the Editors in which I felt they had not done themselves justice. Their remark in the foot-note appended to my observation is quite to the point—that, writing for practical photographers, mathematical niceties would be out of place. No one who had paid attention to their many most excellent articles on optical subjects would think for a moment that ignorance dictated their remarks. Why do they not render the indebtedness of the photographic community complete by elaborating their various contributions on the subject into a readable book? They would have many subscribers. There is a decided want for some such work felt by the majority of reading and thinking men. I know of no one more fitted for the task. If they carry my idea out I shall require a percentage on the profits.

There has, quite recently, been published, by Messrs. Henry S. King and Co., as one of their "International Series," a work on *The Nature of Light, with a General Account of Physical Optics*, by Lommel. A short time since I had occasion to make some severe strictures on a recent volume of the series, which seems now to be withdrawn from circulation; but the present work may in some points be more favourably treated. It has, as frontispiece, the everlasting map of spectra, which is, by the way, the least satisfactory of the sort I have ever seen, owing to its crudity of execution. It is unfortunate that the method of showing them as adopted in Fownes's *Chemistry* is not more universal—I allude to the printing of the series of spectra on a *black* ground, the effect produced being thus exactly similar to what one sees when looking through the telescope of the instrument. Like most translations this work, in its choice of words, shows its foreign origin, and at times with a little mental confusion. The book seems to be otherwise good; but for photographers it cannot be of much use, I should think. This may be judged, for example, by the fact that there is not the slightest mention of a meniscus lens in the chapter on lenses, nor apparently in the whole work, either under its own or any other name. This is a very singular omission, and one, I am sure, that would not happen in the work I have been suggesting. Again, I advise the Editors—"Let them see to it." The advantage of a practical as well as a theoretical knowledge of such subjects cannot be too much dwelt upon.

Speaking of lenses, the split sunshade for attaching to them, as suggested by Canon Beechey, will be of great utility in many instances, and confer quite a new power. He seems to be a most enthusiastic "dry" worker. If ever he work the "beer" process, so highly spoken of by many, I will give him a further hint as to how to test its purity beyond that given in *Foreign Notes* a short time ago:—Let a piece of white woollen be left in over night; then, if picric acid have been used to give bitterness, the wool will be dyed permanently of a more or less deep bright yellow.

I am afraid the concoction of the account recently published of the American photographer who was sued in the courts by a lady after taking her seventeen consecutive times must have been considerably helped by libations of that beautiful fluid with or without picric acid. Only picture to yourself, gentle reader, after seventeen negatives to get no pay, and to have to lose still more time by being summoned to the bar of justice for negligence in making only seventeen trials! A writer in these pages, giving an account of a similar incident in his knowledge where a much smaller number were taken and all disapproved of, and the artist declined further effort, has been guilty of a bit of plagiarism; for the photographer's threat of sticking the sitter, labelled "Portrait of a Britisher," side by side with a type of a nigger in his window, is but an echo of a case that occurred a few years ago in Germany. There, when the sitter declined the prints or payment for them, on the ground of their being totally unlike him, the artist exhibited them as portraits of a notorious murderer. Such difficulties could all be obviated by the universal adoption of the plan of declining to permit the sitter to see the negative, which is carried out in most first-class studios. It is a plan I invariably adopt, for years of experience have taught me the complete truthfulness, not to say usefulness, of the uncourtly adage, "Women and fools should never be allowed to see anything in an unfinished state." If a little firmness, combined with a slight explanation when desired, be adopted there is no difficulty in carrying out the plan.

But the whole subject of negatives is fraught with difficulties. Witness another old, yet burning, question which has recently again been before the courts—I allude to the question of property in negatives. There cannot be a doubt that in equity, provided no special agreement has been come to, the ownership of the negative belongs to the taker of it. Perhaps the best plan might be for all bills sent in to have a memorandum upon them claiming ownership of all negatives; and a similar notice might be exhibited in the reception-room. As parliament is not yet sitting there would be every likelihood of the daily papers taking the subject up were it not that the Suez Canal attracts all attention just now. This is lucky, too, for it is not every good photographer who can view with equanimity the egregious blunders they make, or brook the easy impertinence with which the taking of a negative and a dozen *cartes de visite* is likened, forsooth, to the engraving of a name plate and printing fifty cards. As reasonably might we liken one of their sheets to a set of drapers' tickets.

That there is only one step from the sublime to the ridiculous one is almost reminded of in seeing the porcelain ware of Messrs. Copeland (at the photographic exhibition) decorated with portraits done in a sweet magenta tint. What charming delicacy of conception! what brilliancy of idea and of colour! Next year we may have a further development of the idea perhaps in two colours instead of one only. What originality of design might be evinced by such a scene as the following:—A foreground of hedgerow done in bright orange; middle distance, cornfields of indigo flecked with mauve poppies; pea-green cows browsing to our right, with sky and distance blending into a harmonious set of tones of pink. The method of colouring adapted to that most wonderfully-ingenious and promising of all "types," the Woodburytype, as explained by the Editors, seems to have broken fresh ground and to be really a good thing—the nearest approach possible to fine art by machinery. Why—why—why, though on a smaller scale, will photographers expect to produce works of art by machinery or processes? This is a text I could always preach upon.

Even at the Edinburgh Photographic Society the other day, the old discussion as to the means used by Salomon to produce his wonderful results was revived, and the result as confidently announced as though a complete analysis had been made of a commercial product—say superphospate manure. No one but Salomon could produce his portraits—his *pictures*—though he were watched at every stage. What a magnificent fortune he might have made, if only he had gone in for Salomontype! If he had had M. Lambert's business tact, as well as artistic skill, he might have made a fine thing out of it. The latter process must be a good thing, for all the Browns, Jones, and Robinsons in the provinces are rushing to him—see the weekly list of testimonials, including even sober-minded journalists, as well as the rank and file of the profession. The announcement that next year his licensees will have to pay a still-increased figure is a fine stroke of strategy. Very shortly afterwards his patent will be published, and then will the whole body of photographers be able to know what they are asked to pay for. I would never withhold a penny of his terms from a man who had invented a process, but would never pay simply to work an unknown patent.*

What a pity that the gentleman named by the Paris correspondent of a contemporary, who seems *gobe moche* enough to accept all his statements, did not patent his method of preserving paper. Here it is:—Impregnate a sponge, &c., with citric acid and expose the sensitised paper to its vapours!!! The inventor states the plan will be welcomed by amateurs, because of the softness and vigour of the results, but that the fumes of citric acid in the laboratory will be objectionable. Not a doubt but they would. I would suggest that the wonderful genius leave his keys and his cash at home, lest the fumes from the one should develope, and those from the other tone, the picture at undue times. Fuming citric acid! This is truly one of the latest achievements of modern chemistry,† and worthy of a place with that of Mr. Fry's, of the power of sawdust to extract the silver out of hypo. waste! It is a pity the "Parent Society" does not give medals for original discovery, not to say research. Here are two worthy recipients, *Arcades ambo!* Free Lance.

## THEATRICAL LIME LIGHTS.

I suppose there is not much connection between photography and the stage, and yet photographers—those of them at least who have much to do with the lime light—may learn something from a visit I had an opportunity of making to the new West End theatre in course of erection at Edinburgh. The theatre, aquarium, and winter gardens are being erected by a limited company, and, as there is no lack of money, the arrangements of all are intended to be on the most complete and perfect scale. With this object in view I understand that most of the principal European theatres have been visited, and if the intention of the promoters be fairly carried out the new Royal will undoubtedly be one of the most perfect theatres in the world. The lime-light apparatus consists of two wrought-iron tanks or gas-holders, placed in a building erected for the purpose outside the theatre. From the tanks half-inch iron pipes are carried to the "prompt" side of the stage, and the supply is controlled by levers arranged beside those controlling the illuminating gas, and so can always be commanded by the person in charge. From the levers smaller tubes are led up to the lime-light stage, immediately under the "flies," to the sub-stage, and, indeed, to every place where the light is likely to be required. The burners are simple in form, being simply two tubes merging into one a few inches from the jet. They are fixed into square tin boxes open at the top, and carrying polished cast condensers six inches in diameter and four inches focus, and having in front several grooves into which to slide the *media*—plates of coloured glass. As a measure of precaution, or, perhaps, I should rather say as something to advertise about, a kind of back-action valves have been placed in the pipes between the gas-holders and the stage. Each valve consists of an accurately-ground brass ball, to which is attached a stem that works through a collar. The effect is supposed to be that the gas can only pass in one direction, as any pressure on the stage side of the valve would send the ball up against an accurately-ground socket, thereby making it impossible for the gases to get mixed.

The tanks are eight feet six inches in height and four feet two inches in diameter. At a distance of two-thirds from the bottom there is a gas-tight division, and a somewhat novel arrangement of outlet, inlet, and overflow tubes, converting them, in point of fact, into something like Pepys's gas holders, and giving a pressure of about two feet ten inches of water to begin with, which will, I think, be found too much, and little or nothing at all as the tank gets nearly empty, which will be worse on the other side. As, however, the gas-holder proper measures about five feet eight by four feet two it will contain over sixty cubic feet of gas, so that there can be no necessity for letting it get too low, and therefore I think the arrangement will be found to work well.

From the theatre I went to the painting-room—a huge, temporary wooden structure, in which I found an old and well-known photographer, Mr. W. Truefit, busy at work—not with the camera, however, but at scene-painting—and his work showed that he is really an artist as well as a photographer. I was told by him that he pro-

* M. Lambert's patents have been already published.—Eds.

† "Free Lance" will see from the letter of *our* French correspond nt that essence of lemon was the fuming object.—Eds.

poses to bring the camera into operation, and expects thereby to make a vast improvement in scene-painting. It is intended to transfer to the canvas one of the many fine squares of Edinburgh, and he proposes to make a photograph from a suitable point of view. From this he will produce a transparency, which, by aid of the lantern, will be projected on the canvas, and then the sketching will be a simple matter. In this way he hopes not only to economise time, but enable the artist to paint a much more accurate and faithful scene than it is possible to do by ordinary hand-drawing.

I have some doubt as to whether the average scene-painter will at first take kindly to the innovation; but it seems so likely to answer the purpose that its adoption is but a matter of time, and I think we have in this another example of the close relation existing between all the various branches of art. JOHN NICOL, Ph.D.

## FOREIGN NOTES AND NEWS.

THE TWO LAST MEETINGS OF THE BERLIN PHOTOGRAPHIC SOCIETY: DR. STEIN AND THE "SPIRIT" PHOTOGRAPHS; DEATH OF DR. D'HEUREUSE.—THE FIRST MEETING OF THE NEW PHOTOGRAPHIC SOCIETY AT FRANKFORT-ON-THE-MAINE.—A NEW DENSIMETER.—CHEAP OXYGEN.—FIREPROOF ROOFING.

AT the penultimate meeting of the Berlin Photographic Society the President placed on the table some prospectuses of an art-union lottery, to be conducted by the house of Herr Sachse. The prizes are works of art, 8,111 in number. He then showed two direct photographs of pulse curves taken by Dr. Stein, and forwarded by him to Dr. Vogel. The former gentleman also sent a communication in which he said he had met the notorious Parisian "spirit" photographers, Buguet and Leymarie, at Brussels, and had an encounter with Leymarie at an open meeting of a spiritualistic congress. In order to expose their trick he offered to photograph some "spirits" for them himself, which he did; but, though he explained his *modus operandi*, he failed to convince his audience that it had nothing supernatural about it. He took an excellent portrait of a gentleman, and beside him, when the negative was developed, a female spirit was visible. The way the matter was managed was as follows:—Dr. Stein had a negative in his pocket which he copied in the dark room by the light of a tallow candle before developing.

After Dr. Stein's letter was read the President showed a photograph, sent by Herr E. Boad, of a singular impression on the face of a sandstone rock at Colorado Springs, in America. It was the picture of a bear cut out and coloured on the face of the rock some thirty feet above a deep pool in the stream. Its origin is unknown.

The draft of the law for the protection of photographic copyright now before the Bundrath was then discussed at length, after which the President showed a number of promenade and cabinet portraits by Mr. Rocher, of Chicago, and two numbers of an artistic publication in which the art-treasures of the Bavarian National Museum were reproduced in lichtdruck by Herr Obernetter.

Herr Talbot showed a bottle for pouring collodion, having a projection at the foot which retains the sediment while the fluid is poured off.

Herr Prümm showed some Bohemian glass dark-slide corners forwarded by Dr. Schimann.

The remainder of the business transacted was merely local, and the proceedings were terminated by the reading of a letter from Mr. Sawyer, of Messrs. Spencer, Sawyer, Bird and Co., promising to visit Berlin in the spring, and to explain the carbon process worked by his firm.

At the subsequent meeting, in November, the President announced the death of Dr. A. d'Heureuse, which took place just as he was getting his process into working order. Dr. d'Heureuse's name has been connected for upwards of twenty years with heliographic experiments, and his labours were but lately crowned with success.

Dr. Vogel recommended that a collection of the best German photographs, portraits, and reproductions be made and forwarded to the forthcoming photographic exhibition at Calcutta.

Herr Talbot undertook to make the collection, and forward it at his own expense.

The Society resolved to send a contribution of £50 to the fund for the erection of the Photographic Hall at Philadelphia.

Herr Quidde read the second half of Dr. Krone's account of the German expedition to Auckland for the observation of the transit of Venus.

Herr Jacobi showed two very successful specimens of his experiments in carbon transparencies upon glass. One of them was of a very agreeable brown tone—a tone which was produced by heat. The picture film adhered to the glass without any cement. Herr Jacobi added that it was difficult to transfer the pictures to glass without blisters. He had exposed the pictures in question for about ten minutes, but had not used a photometer. One of the pictures had all the appearance of being printed from an original negative, but Herr Jacobi said it was taken from a paper print. In order to do away with the grain he damped the paper print and placed it upon a glass, through which it was photographed.

Herren Prümm and Schaarwächter thought that the use of the photometer was indispensable in judging of the depth of carbon prints.

The other discussions which took place at this meeting were not of general interest.

The new photographic society at Frankfort-on-the-Maine has arranged to have its transactions published both in the *Mittheilungen* and the *Photographische Correspondenz*. Accordingly the last number of both these journals gave an account of the first meeting of that society. About sixty members were present, but nothing of very general interest transpired. After the election of office-bearers there was a prolonged discussion on M. Lambert's process, in which his agent, M. Colton, took part. The speakers were almost unanimously of the opinion that, with the exception of his frames, there was nothing new in M. Lambert's process. This question has already been discussed at considerable length in the columns of THE BRITISH JOURNAL OF PHOTOGRAPHY.

M. Paquet, professor of natural philosophy at the college of St. Dié, has invented a new instrument, called a "densimeter," for determining the specific gravity of very small solids and of liquids. The instrument is pear-shaped, like Baume's areometer, and has two tubes filled with water up to zero marked on their side. On the scale at the side of one of these tubes the volume, and on the other the weight of the substance weighed, is indicated. Thus, if the level of the water in the tube be raised from zero to three centimetres, the volume of the substance will be three cubic centimetres, and if the indicator have sunk to mark 5·5 grammes, then its specific gravity is $\frac{5.5}{3}$.

In consequence of Herr Kuppelweiser, of Vienna, having discovered that oxygen can be cheaply manufactured from manganic dioxide by the process proposed by Tessié du Motay, M. Patrian, a gas contractor, of Paris, proposes to revolutionise the lighting of theatres, *cafés*, workshops, &c. For this purpose he has already stored considerable quantities, in metallic receivers, at high pressure. Besides the increased application of oxygen to oxyhydrogen lighting and the supplying of metal workers, it is proposed to utilise it in a new method of ventilation, and in the preparation of medicinal baths of air and oxygen at various degrees of pressure.

As the fire insurance offices in this country look askance at photographic premises, it may not be amiss to say a few words about the asbestos fire and waterproof cement and felt roofing, now becoming popular in America. It has been known since the time of the ancients that asbestos possesses the valuable property of resisting the action of flame; but it is only within the last few years that that property has been utilised—at least, to any great extent. But American invention has discovered that it can be made into a cement, which is a very good non-radiator, and can be applied to the surface of pipes and boilers even when they are hot. When it has hardened it is adhesive, incombustible, and elastic—not cracking with the expansion and contraction of the pipes. Three coats are usually employed, and the last coat has a hard, smooth, white surface, like plaster. It is largely used for roofing, combined with fireproof felt.

## A NEW METHOD OF IMPARTING ARTISTIC FINISH TO PHOTOGRAPHS.

[A communication to the South London Photographic Society.]

THE subject I have selected to bring before you this evening is, I believe, somewhat new. But as to any absolute novelty in the photographic world, is there such a thing? I doubt it. Any way, the plan I now have the pleasure of submitting for your approval possesses the qualifications of simplicity and inexpensiveness, combined with the power of imparting an artistic appearance to certain classes of photographs, and, to the best of my belief, has to the present time escaped general observation.

It consists in a recommendation to sand-paper your mounted and enamelled proofs—not for the purpose to which sand-paper is generally applied, but to produce roughness. The materials are few and their application easy; they consist of sand-paper of various degrees

of fineness, cardboard, and glue—that is all. Use them after this fashion:—Cut a piece of cardboard somewhat larger than the mounted proof, upon which glue sand-paper, face up, and when dry cut out an aperture corresponding exactly in shape and size with the picture to be operated upon; make the edges of the aperture smooth and even. This constitutes the mask or die. Suppose it is a medallion portrait of the usual *carte* size you wish to finish: fit the sand-paper mask, face down, on the enamelled side of the portrait, adjusting it so that the oval picture corresponds with the aperture of the mask. Place a piece of smooth paper outside for the purpose of printing, scratch on the polished parts, and pass the whole through an ordinary rolling-press, face down. On removal it will be found roughened on those parts that have been in contact with the sand-paper, and the polish and relief of the smooth portions greatly enhanced by the contact. Various degrees of fineness may be obtained by slightly shifting the position of the mask, and putting through the press after each alteration. This is the novelty. Other substances besides sand-paper can be used. Probably an engraved metal plate would be better; in fact, almost any textile fabric, such as net, gauze, lace, &c., is applicable. For my own part, I prefer the effect of sand-paper to a more ornamental design—a flat matt surface being as good as anything, if not better, for giving value to the polished part.

My plan was published in THE BRITISH JOURNAL OF PHOTOGRAPHY of last week. Possibly some present have given it a trial. If not, I should advise them to do so. E. DUNMORE.

## NOTES FROM THE NORTH.

THANKS to photography, if the public generally be not well acquainted with the physical appearance of almost every corner of the earth they ought to be, as there are very few places which have not been brought under the truth-depicting influences of the camera. Judging from the enormous quantity of photographs—good, bad, indifferent, and of every place of any note at all, and of many places of no note whatever—that are so frequently brought under our observation, one would imagine that with those who travel a camera and a few dry plates are becoming as much a matter of necessity as a change of linen.

Who, a couple of years ago, would have thought that anybody could have photographed in that sometimes called "God-forgotten place," Kerguelen's Land? or who, supposing it had actually been photographed, would have taken the trouble to go and see the results, much less pay for admission thereto? And yet both most unlikely contingencies have actually come to pass, and very successfully too. The Rev. Father Parry—who seems to be an astronomer of no mean repute, and who was sent in charge of the transit expedition to that out-of-the-way part of the world—combines, as all wise men ought to do, photography with astronomy, and without neglecting his work proper, as the results of the expedition abundantly testify, has managed to bring home a large collection of negatives—not only of the buildings, instruments, and people connected with the observation of the transit, but also of the island in all its barrenness and boldness of outline—which in half-an-hour convey more really exact information than could be communicated in a whole volume. From those negatives lantern pictures have been made, and were exhibited by the Rev. Father Parry in the Queen-street Hall, Edinburgh, recently, in illustration of a lecture which he delivered on the subject of the expedition. The pictures were, on the whole, remarkably good, and were thoroughly appreciated by a large audience. During an interesting conversation I had with the reverend gentleman on the subject I learned that the negatives were all taken on dry plates. He took out a large number of bromide plates—not emulsion, but bromised collodion sensitised in the bath. He found they did not come up to his standard, so they were abandoned in favour of "beer and albumen" plates, which he prepared on the spot, and which were found to work to his satisfaction.

"Keep a thing seven years and you will find a use for it" is an old saying; but in the case of negatives I think the time might be very considerably extended, or, better still, altered to—"Never destroy a negative if it can possibly be kept, as it may become of value some day." By way of encouragement let me relate an incident which recently came to my knowledge. Those who took an interest in photography before the advent of collodion know that the late Mr. D. O. Hill, of Edinburgh, in conjunction with Dr. Adamson, of St. Andrews, produced a large number of calotype negatives of a high order of merit. Their portraits, indeed, as is generally admitted, have never been surpassed in art-feeling and general excellence. Some time after the death of Mr. Hill they, along with a large quantity of his effects, were brought to the hammer, but no offer could be obtained for the negatives. Subsequently one of the members of the Edinburgh Photographic Society purchased the whole—nearly a thousand—for ten pounds, and, after selecting what he principally cared for, sold the remainder, mostly portraits, for half that sum. Of these a number were presented to the Edinburgh Photographic Society and the rest laid aside, and valued more as specimens of the work of an early period than in the hope or expectation of their ever having a commercial value. Some time ago Messrs. John Greig and Son, seeing that the fathers of the Free Church of Scotland were fast dying out, conceived the happy idea of publishing a book giving an account of them and their times—*Free Church Worthies* is, I think, the title—and the still happier idea of illustrating it by carbon photographs. The only difficulty which seemed to stand in the way was the question as to how the necessary negatives could be got together, supposing them to be in existence.

The difficulty was soon solved. Mr. D. O. Hill, as is well known, painted the celebrated *Disruption* picture, which contains some hundreds of the men who were the leaders in that historical movement, and it was equally well known that, to a large extent at least, he painted from photographs taken for the purpose, and so it was probable that the required negatives might be found amongst the collection purchased by our friend. On examination this turned out to be the case, and after a little negotiation an offer was made and accepted of *twenty pounds* for a loan of about forty of the negatives. Of course amongst such a number there would be a considerable variety of arrangement in the introduction of accessories and in the general style; and with a view of bringing them into something like uniformity, and to a more suitable state for book illustration, it was decided to make a print from each negative on albumenised paper, get them suitably touched up by a competent artist, and then make negatives of a vignette form from them. It was further decided to send the negatives so made to the Autotype Company to be printed, and if the stock should turn out as well as several specimens I have had an opportunity of examining the publishers will have no cause to regret the resolution they came to, and the public generally will have another proof of the admirable suitability of photography for book illustration.

Copying is every day becoming a more and more important part of the work of a professional photographer, and sometimes the operator is sadly puzzled with his attempts to contrive a satisfactory method of lighting the picture to be copied. Of all the methods I have seen the following, which I saw in operation in the studio of one of my friends, is, I think, the best, both for simplicity, economy, and efficiency:—It consisted of a rough deal board, about eight feet long and fifteen inches broad. One end of this rested on the floor and the other on a table, by which arrangement any desired angle could easily be attained. At the lower end of the board there was firmly nailed at right angles a piece of wood fifteen inches square. The print, kept flat by being placed in an ordinary printing-frame, was placed against this footboard, so that it was exposed to the action of both the top and side lights of the studio. The focus of the lens being known, and the size of the copy determined, it was only necessary to adjust the distance between the lens and the ground glass, and then slide the camera up or down the board till the proper focus was obtained, when it was kept in position by a nail. By this arrangement first-rate work was being rapidly done, although the adjustment of the various planes might be made more easy of accomplishment by the expenditure of a few pence on the improvement of the apparatus. The board should be planed, and have drawn on it a few longitudinal lines as guides to the camera. Long strips of wood would be better, but then only one camera could be used, and a mere pencil line would show perfectly when the camera was square on. The same arrangement reversed would answer admirably for making lantern pictures from large negatives, if the footboard had an opening cut in it in which the negative could lie. Those who bother themselves with cumbrous copying cameras, under the impression that it is necessary to cut off all light except that which comes through the negative, should give this method a trial, and I know they will find that in this, as in most other matters, simplicity and efficiency go hand in hand. JOHN NICOL, Ph.D.

## OUR CLUB.

### No. XVI.—HOME AGAIN.

SUMMER is gone, winter is closing round us, and having made a good run out of the warm, genial months we now thought of taking our departure from country scenes and returning again to town with its folks

and its fogs. Like the swallows we wished to fly away to more congenial scenes than those that surrounded us now—leafless trees, and bare, brown misty hills, frozen pools, crisp roads, while the very faces of the inhabitants seemed to bear the impress of the winter's tale. Then came a heavy fall of snow, blanching our little world. Everything was white—beautifully white—away, far away in the distance, far as the eye could reach, where the hoar haze blending with the snow became one, shutting us in all covered over with white; and yet so still, so pitiless, and so cold!

Being more prosy than poetic we cared not to leave the house and trudge away across the hills where the frosted heather twines round one's legs, making the boots and stockings soaking wet and the wearer miserable; so, dreading rheumatics rather than loving romance, we left the silvery-feathered branches and the glistening, sparkling hedges golden-spangled in the yellow sun.

We had a good view from our bedroom window, from which standpoint I made my observations. And then we lacked evening amusements, the greatest excitement in the world being produced by a "penny reel" or the visit of a wax-works. So we really began to long for the pleasures of the town. With light hearts we collected our accounts and our traps, and made for the station. We had made many friends during our stay, and they parted with us wishing us all sorts of good luck. Old Peter especially was moved. It was a sight to see him as he stood at the station with his arm round Joe's neck (Joe was going home with us). Peter was smoking a short "cutty," and was brushing the tear away from the side of his nose every now and then. He complained very much of the frost making his eyes water so.

"Now, Joe," Peter said, "good-bye, my laddie. Aye mind what yer masters say to ye, and due their bidding and there is na fear o' ye getting on. Ye have a' the makings o' a guid man, so dinna spoil yersel by putting on the airs o' the town folks ower sune; but leave pride behind, lad, and stick to business, and, mind ye, when I come to the town I'll ca' on ye and see how you're behaving yersel, and then I'll see whether ye have taken my advice or no." Then, coming up to us in his pawky way he said—"Well, gentlemen, the best o' friends must part, and so maun we; and I am sorry for it, for I maun say I never spent a happier or mair profitable season in my life. And I wish ye sune back; but that's no likely, for ye men o' the world wi' yer railways and yer telegraphs jist gang about like a flash o' lightning. But ane thing I'll say for our toun, Mr. Oute, ye may gang farer and fare waur."

"I am quite convinced of that, Peter," I replied, "so keep up your heart, old man; you havn't seen the last of us."

We had sold the horse and we had had the dog-cart put into a waggon with some other of our baggage, all ready to be joined to the train when it came up. At length, puffing and breathless, the train entered the station. We shook hands with the old man, who looked wistful and sad, got comfortably seated, and I took my place so that I could see the station as long as the train was in sight. Looking back I could see the station-house at the front of the hills, and Peter like a speck, standing motionless as a statue, looking after us. Whisk!—round a curve and both are lost to view!

And so ended our summer trip. That night, as we sat round the blazing fire, we felt very contented and happy, for—

"The first sure symptom of a mind in health
Is rest of heart and pleasures felt at home."

MARK OUTE.

# Meetings of Societies.

## LONDON PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting of this Society was held on Tuesday evening last, the 14th instant,—Mr. James Glaisher, F.R.S., President, in the chair.

The following new members were admitted:—Mrs. Harriet T. Paget, Mrs. S. G. Payne, Messrs. W. G. Hunter, D. Knapping, W. M'Leish, L. Warnerke, S. G. Payne, F. W. Mills, R. Kennett, Geo. Mansfield, Henry Dixon, F. T. Palmer, Thos. Bolas, Wm. Bates, E. Pailthorpe, B. Wyles, and P. W. Radcliffe.

The CHAIRMAN said that the exhibition was always a source of anxiety, but the recent one had proved a great success both socially and financially. Many names they missed with regret, but their places had been filled up by many others connected with work of a high order.

Mr. E. Viles read a paper *On the Manipulation of Large Plates*, and at its close directed attention to a spirit-level which he had found of great utility in getting the ground glass of his camera placed in a perfectly vertical position. The instrument is known as a "plumber's level," and is fitted with two spirit-tubes—one placed at a right angle to the other.

Mr. W. T. WILKINSON (referring to a statement in the paper concerning the splitting off of the collodion and the preventing of the same by a wash of diluted albumen previous to varnishing) said that in working with the large plates (many of which were 48 × by 36 inches) used in the Autotype Factory he had experienced the same tendency, but had overcome it by rubbing powdered French chalk over the plate. He found a very convenient support for the plate to consist of a pad of American leather cloth, supported in the mouth of a jar.

Mr. VILES observed that the india-rubber ball he had recommended for this purpose performed the functions of a universal joint.

Mr. WILKINSON said that he also used the ball, but he covered it with the leather cloth, and found the slipping off of the plate almost an impossibility.

Mr. W. ENGLAND preferred the use of a dish for developing large plates, and had never found it troublesome. In working in a tent he considered it more advantageous to develope the plates in a dish than to hold them in the hand.

Mr. F. HOWARD asked if Mr. Viles allowed his plates to become dry between developing and intensifying, because, if so, that was a fertile cause of the film splitting.

Mr. VILES explained that after developing the plate it was rinsed, then floated over with dilute acetic acid, and kept moist till he returned home. He asked if there were any objection to the use of albumen as a preliminary coating before varnishing.

Mr. HOWARD said there was not; he had hundreds of negatives treated in that way.

Mr. J. SPILLER, about twelve or fifteen years ago, had examined a number of Indian negatives with a view to discover the cause of vermicular markings upon them; the result of his inquiries was that they were due to a coating of gum arabic having been applied to the negative previous to varnishing. He had never heard of a similar case of fading when albumen had been employed in that manner, owing, doubtless, to the greater elasticity of the latter substance. The negatives alluded to were by the tannin process.

Mr. ENGLAND strongly recommended shellac varnish as the best kind for preventing the collodion film from splitting.

Mr. HOWARD enjoined the necessity of care in seeing that every trace of moisture was driven out of the film by means of heat before applying the varnish.

A vote of thanks was passed to Mr. Viles.

After the exhibition of a chart, giving the registration of the actinic power of the light in Blackpool, sent by Mr. Winstanley, the meeting was adjourned.

## SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE annual meeting of this Society was held on Thursday, the 9th instant,—the chair being occupied by the Rev. F. F. Statham, M.A., F.G.S., President.

Messrs. J. Good, G. Howard, and F. Hollyer were admitted as members.

The Secretary then read the following—

### ANNUAL REPORT.

YOUR Committee, in presenting their report for the year 1875, congratulate the members on the continuous prosperity of the South London Photographic Society, which has now concluded another session evincing great vitality and consequent realisation of good results. As our Society is eminently a social one, so its mission should correspondingly be an appeal to similar qualities amongst the masses; and hence your Committee refer with gratification to another phase in its history, viz., the institution of a popular meeting for the exhibition of lantern slides produced by members and others, which holds out for the future both general and individual profit. The Annual Technical Exhibition Meeting has now assumed an important position in photographic circles, and has fully justified the intentions of its founder by the great interest and increased attendance which accompanies its yearly recurrence.

In other ways the papers read and discussions arising therefrom have possessed much and varied interest, and have in some instances formed new standpoints in the practice of photography. The following papers have been read during the session:—*On the Nitre-Sulphur Light*, by J. Spiller, F.C.S. *On Stereoscopic Transparencies*, by F. Howard. *On the Relation of Lighting and Exposure to Texture*, by G. Croughton. *On Photographic Status*, by E. Cocking. *My Experience During the Last Season*, by F. York. *History of Carbon Printing*, by J. R. Sawyer. *Archer's Formula*, by W. Wilkinson. *A Novel System of Masking, and the Production of Brilliant Results from Weak Negatives*, by W. Brooks. *Uranium and its Uses*, by J. Werge. *Negatives on a Transparent Film*, by Leon Warnerke. *On Impurities in the Negative Silver Bath*, by S. Fry. *A New Studio Window*, by H. Vanderweyde. *A Simple Method of Printing Ornamental Borders on Carbon Prints*, by E. Foxlee. *A New Way of Finishing Photographs*, by E. Dunmore.

Photographs, apparatus, and exhibition of various processes have been shown by the following gentlemen:—J. R. Sawyer (carbon printing), R. Kennett (emulsion process), Leon Warnerke (sensitive negative tissue), and S. Fry, J. Spiller, F. Howard, Ferneley, F. York, Oakley, G. H. Simpson, G. Croughton, W. Brooks, J. Werge, H. Vanderweyde, Cleary, E. Foxlee, Murray, Howarth, J. Nesbitt, Baynham Jones, A. Brittlebank, D. Waymouth, and D. C. Dallas.

A large accession of new members during the session has increased the power of the Society to carry on its work with a greater amount of prestige than it has hitherto been enabled to do.

In conclusion: your Committee feel that, as long as the pleasure arising from social reunions continues amongst those who practise a common study (where art and science are united), so long will be the prosperity of the South London Photographic Society.

TREASURER IN ACCOUNT WITH THE SOUTH LONDON PHOTOGRAPHIC SOCIETY.
*Dr.* From Christmas, 1874, to Christmas 1875. *Cr.*

| Dr. | £ | s. | d. | Cr. | £ | s. | d. |
|---|---|---|---|---|---|---|---|
| Balance from 1874 ............ | £18 | 5 | 1 | 1875. By Cash paid to Secretary .............. | £5 | 5 | 0 |
| 1875. 9 Subscriptions received by *Treasurer* ........ | 4 | 14 | 6 | ,, Presentation Print, 1873.............. | 6 | 7 | 6 |
| 41 Subscriptions received by *Secretary* ........ | 21 | 10 | 6 | ,, Expenses, use of Hall | 14 | 12 | 6 |
| | | | | ,, Printer's Account .. | 2 | 19 | 7 |
| | | | | ,, Secretary's Petty Cash, Postage, and Stationery........ | 5 | 18 | 4 |
| | | | | ,, Balance ............ | 9 | 7 | 2 |
| | £44 | 10 | 1 | | £44 | 10 | 1 |

1875. Balance..£9 7 2.

The report and balance sheet were adopted.

The election of officers for the ensuing year then took place, with the following result:—*President:* Rev. F. F. Statham. *Vice-Presidents:* Messrs. Brooks, Spiller, York, Howard, Simpson, and Hughes. *Committee:* Messrs. Aldridge, Ayres, Hunter, Foxlee, Wilkinson, Dunmore, Warnerke, and Barnes. *Treasurer:* Mr. Noel Fitch. *Secretary:* Mr. E. Cocking. The result of the ballot was such as to cause a special proposal to be made that the name of one gentleman who, presumably from inadvertence, had not been elected should be specially added to the list of vice-presidents, which, to meet this case, was increased to six, as above stated.

Mr. E. Dunmore then read a paper on *A New Method of Imparting Artistic Finish to Photographs.* [See page 606.] This method, we may observe, has already been published in this Journal by Mr. Dunmore the week previous to that in which it was read.

Mr. NESBITT inquired if the special effect described could be produced on albumenised prints, or was it necessary that the prints should be enamelled.

Mr. DUNMORE explained that, while it was applicable to albumenised paper, an enamelled surface was better.

Several slight modifications of the process advocated were suggested by members, but as these had been already suggested by Mr. Dunmore himself in the original paper published in our issue for December 3rd we need not allude to them.

Mr. Kennett exhibited a camera-stand, in which were combined the extremes of portability, adjustability, and rigidity. It was carefully examined.

After votes of thanks to Mr. Dunmore and Mr. Kennett the meeting was adjourned.

## MANCHESTER PHOTOGRAPHIC SOCIETY.

THE ordinary monthly meeting of this Society was held at the Memorial Hall, on Thursday evening, the 9th inst.,—Mr. Alfred Brothers, F.R.A.S., Vice-President, in the chair.

The Chairman read the following letter from the Rev. Canon Beechey, M.A., ex-President, and handed round a number of emulsion negatives and Canon Beechey's mountain camera, fitted with the split sunshade:—

*Hilgay Rectory, Dec.* 7, 1875.

"DEAR MR. ADIN,—I have requested Mr. Taylor to send you for the meeting on Thursday—1. The negatives of wet-plate quality. 2. The fine split sunshade on my little mountain camera. 3. Two negatives with paper attached which exemplify its working. I ask you to hold the one of the rectory up against a strong light, and see if you can detect the slightest trace of the sunshade, although the trees and grass were exposed three minutes, whilst the house had only thirty seconds. It may be interesting to the members if I add a few remarks on the method of using the sunshade, and also on a subject closely connected with it, viz., blurring.

"The fine little shutters of the sunshade are, as you see, quite independent of each other—each one may be of any height and any distance from the lens; of course you would lower the one which would best shade a too-light object. In the case of a waterfall, like that in the *Fairy Glen, Bettws-y-Coed*, the centre shutter would be alone required, and you would lower it until the entire opening and fall were shaded. Five minutes, with a very sensitive plate, would not be too long an exposure for the green, dark, and gloomy rocks on either side of it; five seconds would be sufficient for the sky and fall, whereby all the transparency of the water would be secured, and all the details of the shrubs and stones be equally rendered. But, suppose the fall were the *Swallow-Tail Fall, Bettws*, you would then probably put down two in the middle, so as to shade the fall pretty low down; then you would lower those on either side of the centre, so as to shade the sky to the level of the top of the fall. You need not be very particular as to their fitting on, though, of course, the nearer the better. The two shutters on the outside would be up to allow of long exposure on the trees above the fall. All being arranged to your mind pull the little trigger and shut off the picture, screw the shutters tight in position, put in your dark slide, expose from three to five minutes or less, and then lift all the shade as usual by the milled head on the left hand. Continue the exposure of the whole picture five seconds or so, and shut off by the trigger again.

"It will rarely happen that any other arrangement of the sunshade is necessary. But, supposing you were taking *Fingal's Cave*, and wished to shade the sea and rocks so as to give the dark roof and interior a very long exposure, by moving the shade round a quarter turn you may quite conceal the lower half, while the upper is exposed; or, if a waterfall be oblique, the angle may easily be adapted to suit it. You will also notice that the width of space shaded by a single shutter depends on the *closeness* of that shutter to the lens, so that very often one shutter may be made to cover as much as two—only, of course, the shadow will come lower down; but, as each shutter is longer than the outer diameter of the lens, even that is capable of much adjustment.

"Now, as to blurring: I have not discontinued the experiments referred to a year ago in the Journal. These experiments and the use of the split sunshade have made me almost positive that what is commonly called 'blurring' is not caused by reflection from the back of the glass, but simply by over-exposure of a very bright part, whilst the darker is proceeding. A bright window in a dark church will blur if you back the plate ever so nastily. The ruined arch against the sky in the *Castle Acre Ruin* you will find blurred in the perfect negative, but quite free from it in the one where the sunshade was used, though not lifted high enough at last. You may almost prove this by the fact that as you develope the blurring does not appear at first. The arch or windows will come out beautifully sharp and clear, and, if you could stop there, there would be no blurring. As, however, you proceed to force out the dark detail your arch blurs, just as a very much *over-exposed plate would blur all over.* The use of the sunshade here will be very evident.

"But let me tell you the somewhat singular result of my recent experiment with silver-backed plates. I wish I could send you a silvered plate before it is coated, that you might see what beautiful looking-glass the real silver deposit on a plate by Liebig's process makes. Well, I tried several times this experiment:—I prepared three plates at the same time, with the same emulsion and preservative. A was backed with brilliant silver; B was backed with non-actinic red ochre; C was left unbacked. These plates were exposed for the same time on a blurring object, viz., the dark north side of a church with the bright sky above and behind it. The exposure was for one minute. The result was very remarkable. In A the ridge tiles were *very little blurred;* in B and C they were not. But A *was at least three times as dense a picture* as B, and B was also less dense than C. In A all the detail was fully out, every stone in the dark wall being visible, and yet even the vane and flagstaff on the tower were as sharp as thread though slightly fogged, simply showing over-exposure. I will try a few more experiments yet to make quite sure; but I am almost able to say positively that non-actinic backing prevents blurring only by making a plate *much less sensitive*, so requiring much longer exposure. In a second experiment I gave the backed plate three times as long exposure as the silvered plate, and still the silvered plate was far more dense, *sharp*, and full of detail. I attribute this result to the direct perpendicular reflection of every bright point on the white surface of the film from the silvered back on to the *back of the film.* By this means the back of the film has the picture projected upon it at the same time as the front; whilst from the non-actinic backing the front of the film is alone affected, even if the yellow reflection from the back does not actually retard it. I believe that astronomical photographs, such as the transit of Venus, if taken on silvered plates would require only half the exposure they do now, and would be quite as sharp and more dense. I think it is the *surface* of the film which takes the impression, and with silvered backs both surfaces are impressed. It is quite possible that with *very transparent* films a double reflection might ensue, particularly near the extremes of the picture, but I have never been able to trace the least appearance of one.

"As your notice says you have no paper for the evening I send you this, if only to afford you a subject for discussion.—Your old faithful ex.-P. and V. P.,

"ST. VINCENT BEECHEY."

Mr. James Young exhibited half-a-dozen small lenses of different foci, mounted for insertion between the lenses of a doublet for the purpose of altering its focus; also, a small dropping-tube, made by putting an ordinary vulcanised rubber teat on the end of a bit of glass tubing drawn out at the end.

Mr. Chilton exhibited some half-dozen negatives taken on Liverpool emulsion plates. These were considered better than those sent by Canon Beechey.

Mr. Parkinson exhibited a rude-looking, but most efficient, holder for large plates.

Mr. D. Young exhibited some slides by Mr. Dixon, of London, the subject being *The Arctic Expedition Vessels and Crews.*

Mr. Pollitt and Mr. Lever had each brought Silber and fountain lamps, and the members adjourned to the lantern room to test these lamps against the sciopticon. The lantern in which the lamps were used and the sciopticon were mounted together, at the same distance from the screen, and gave similarly-sized discs. There was no mistake about the superiority of the sciopticon over all competitors yet tried.

After the usual votes the meeting was adjourned.

# Correspondence.

MEETING OF THE PHOTOGRAPHIC SOCIETY OF FRANCE: DISTRIBUTION OF REWARDS BY THE PRESIDENT OF THE "SOCIETÉ BELGE"; A NOVEL FILTERING TRAY; FATTY-INK PROOFS; M. DAVANNE ON METALLIC SPOTS IN PAPER; SEVERAL PRESENTATIONS BY M. FLEURY HERMAGIS; M. GOBERT ON THE MEANS EMPLOYED TO DETECT FRAUD.—RECTIFICATION OF AN ERROR RESPECTING THE GIANT TELESCOPE.

THE Photographic Society of France held its monthly meeting on Friday evening, the 3rd instant,—M. Peligot, the celebrated professor of experimental chemistry, in the chair.

Before the business of the evening commenced the Chairman welcomed among them M. G. de Vylder, the President of the *Association Belge de Photographie.* This gentleman had undertaken the journey from

Brussels to Paris in order to have the pleasure of distributing the medals and other rewards which were assigned to the French exhibitors in the last photographic exhibition held in that city.

M. G. de Vylder thanked, in a few but well-chosen words, the Photographic Society of France for its aid, advice, and communications to the Belgian Photographic Society during its infancy, and to which (he said) they were indebted for the firm footing they had obtained and the success with which their exhibition had been crowned. He (M. de Vylder) then distributed the medals in the name of the Society, with appropriate remarks to each recipient, and concluded by hoping that the rewards would act as a stimulant to the successful competitors to persevere in the road they had chosen; for, although much had been done towards the advancement of the photographic art, still, he believed, very much remained to be discovered by those hardy pioneers who were brave and steady enough to seek for it.

M. Quinet brought before the meeting a new horizontal filtering tray for the negative bath. Under the ordinary covering was adjusted an upright ridge of glass to within an eighth of an inch of the top. This ridge was perforated with say four or five holes in a bridge-like shape. On the back of this ridge was placed a filter which stopped up the holes. The silver solution was then put into the tray, and the latter immediately brought from a horizontal to an upright position; the bath ran over the ridge, and the ordinary covering for such trays acted as a reservoir and kept the liquid from running over. The tray was then placed in a horizontal position, and the upright ridge prevented the silver solution from gaining access to the tray otherwise than by passing through the filter. In a few minutes the liquid was found on the ridge side, and the bath was then ready for use.

M. Despaquis presented to the Society some very fine specimens of his new process of fatty-ink printing.

The Vice-President, M. Davanne (who, by the way, is very well-known to our readers), gave a verbal description of the experiments he had made in order to discover the cause of the spots frequently found on albumenised paper. He proved beyond doubt, and to the satisfaction of all present, that those spots were caused by a certain dust of metallic oxide being deposited on the back of the paper in undergoing the operation of rolling. M. Davanne laid the fruits of his experiments before the members, which they examined with great interest.

The members, after a slight discussion, were unanimous in their opinion that it would be well to write to the paper manufacturers and ask them to cease the rolling of the paper intended to be employed in printing with silver salts. Upon mature reflection the members were of opinion that the rolling of paper was useless, as the different baths through which it had to pass destroyed the advantages without being able to eliminate the disadvantages.

M. Davanne's communication may be of great service to the readers of The British Journal of Photography; for we all know the annoyance which these metallic spots give to the photographer, and if this cause of failure can be got over simply by requesting the manufacturers to supply us with unrolled paper it will be the better for them and a great gain to the profession.

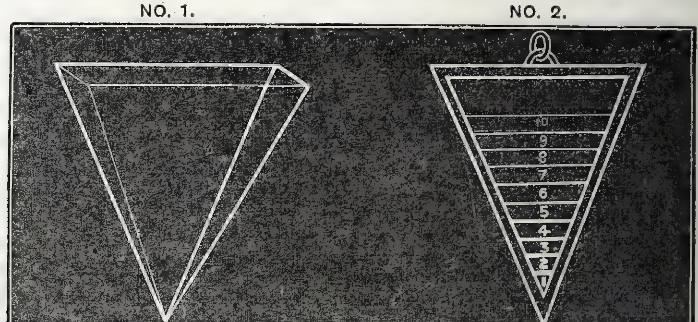
M. Fleury Hermagis made a communication on the manner of preserving albumenised paper, already salted either before or after printing, by means of the vapours of an essential oil. "The feeble quantity of light," he said, "in these dull days necessarily creates a difficulty in obtaining silver prints. I thought the moment *apropos* for laying before the Society a method for the preservation of positive paper which has succeeded exceedingly well in my hands. This method is due to an American amateur, Mr. Devey, and his idea has been the point of departure for so many interesting experiments which have not only rendered me great service but also many persons to whom I recommended its employment, that I think I am in duty bound to propagate such a valuable idea. The operation is very simple:—

"Take a box about one foot square and two feet high, and at about five inches from the bottom construct a false bottom of trellis-work. Take a few pieces of cotton saturated with essence of lemon, put them through the holes between the trellis-work and they will fall to the bottom. Put the proofs to be preserved into the box and close the lid. In the perfumed atmosphere of the box the proofs will not turn yellow for several days, which is a great advantage in winter, when the quantity of proofs obtained is not sufficient to warrant the trouble of toning, as they can be left and added to the next day's batch. Chloride of silver paper can be kept fifteen days, or even a month, if the paper be previously acidulated by citric acid, and be prolonged four months if a larger quantity of citric acid be employed. The simple means which I highly recommend will, I have no doubt, entice many persons who prefer harmonious tones to make a trial of it. It is well known that proofs which have not been toned and fixed immediately after printing are superior to those operated upon directly after the impression, both as regards beauty and harmony of tone. I tried essence of lavender in comparison with essence of lemon, but the results were very bad. Probably this may be attributed to its impure state, as this essence is rarely to be found perfectly pure. Turpentine had a pernicious influence on ordinary paper, but was without action on paper which had been previously accidulated with citric acid. A few of my customers have complained of the pernicious effect of the emanations from these essences in a laboratory. It is well known that fresh paint produces fog; it is the same, I am assured, with vapours of lemon and other essences, as they diminish very much the sensibility of dry plates. This inconvenience is very easy to be avoided, especially as the cause is known. It would, indeed, be very unwise if for such a frivolous reason an idea like this were thrown aside—a process, too, which offers so many advantages."

M. Hermagis then exhibited a new *camera obscura* for dry-plate work—the "new" feature in it being that there is no bellows (if that can be called "new"). This is replaced by a helicoidal screw round the lens, which permits it to be drawn in and out (about two and a-half inches) with the greatest ease. The camera is hinged together in such a way that it falls flat for packing; it weighs very little, which is a very excellent thing for young amateurs.* But there is a great drawback to the general use of such a camera, namely, that only one lens can be employed, and no sensible photographer or experienced amateur would content himself with a single lens on an excursion. Such a camera is very good for a novice; but he will soon find that lightness must not always be pitted against convenience, and that if he wish to do good work he must have a good camera with two or three lenses of different foci to do all sorts of work.

For the last few years the constructors of photographic instruments (on the continent) have, according to my idea, followed a false route. They make light instruments without corresponding benefit; and if they persevere in that direction, instead of taking on a tour one camera with a lens or two, we shall be obliged, in order to do the work, to carry several *light* cameras with lenses to match. In conjunction with the camera M. Hermagis described a photometer of his invention. He has named it the "*photometre à prisme.*" He introduced it to the members as follows:—"The little instrument which lies before you may justly be called the '*corellaire*' of my tourists' camera, for without a photometer it is completely impossible to judge of the time of exposure with any degree of exactitude for dry-plate work—sufficiently exact for the purpose for which I intended it. I must say that my photometer is far behind that of M. Léon Vidal's, which is marvellous in its gradation and in its precision, but which requires an immense amount of care and intelligence in its construction. I desired simply to put into the hands

NO. 1. NO. 2.




of every operator a simple photometer, having greater precision than the ordinary ones formed in general by the superposition of different layers of paper or mica, unequal very often in thickness and in colour, and liable, at the same time, to be influenced by the temperature or by the light. My photometer is a simple prism made of yellow glass, framed in such a manner as to become an ornament for a watch chain. Upon the inner surface of this yellow glass prism lines are drawn, numbered from 1 to 10. No. 1 represents the thinnest part of the prism, and No. 10 the thickest. A piece of sensitised paper is introduced under the prism and allowed to remain one minute in the shade. It is then examined, and according to the number the impression has reached it is very easy to calculate the photogenic power of the light."

* Both lens-mounts and cameras of the kind described have been in use in this country for *many* years.—Eds.

In order to give my readers a correct idea of this photometer I enclose two sketches of the exact size of the instrument—No. 1 being a side view of the glass prism, and No. 2 the front view of the prism when mounted in a gold or brass frame.

M. Relaudin laid before the Society a new dark slide for dry-plate work. The slide has a folding shutter or curtain. This is, perhaps, the first time that a rolling shutter has been employed for dry-plate slides; but the idea is by no means new, for, in my description of this folding shutter (see THE BRITISH JOURNAL OF PHOTOGRAPHY, No. 763, page 606), I mentioned MM. Gilles, or rather their former partner, as the inventor. The patent having lapsed, anyone is at liberty to manufacture such shutters.

M. Gobert, of the Bank of France, gave a very interesting and instructive lecture on the manner employed at the Bank to detect forgeries. He informed us that, although the insoluble part of the ink had been erased or scratched off, still the soluble part had penetrated into the fibres of the paper, and, although invisible to the forger and to the eye, the writing could be easily renewed by a simple chemical reaction and the forgery detected. He passed round a piece of paper upon which had been previously written the sum of 24 francs, 30 centimes. This had been effaced and 2,986 francs substituted in a very masterly manner. M. Gobert dipped this paper into a solution of ferrocyanide of potassium, and having held it for a few minutes over the fumes of hydrochloric acid all the original figures became visible. M. Gobert said this system could not always be employed for fear of spoiling some valuable manuscript, but to avoid this photography is called into action. The reproduction of the false note is made, and the forgery, if there be one, can be easily detected; for the lens appears to have an extraordinary power of penetration, and really produces in a clear and defined manner objects which the forger employed all his talents to hide from the naked eye. M. Gobert passed round for inspection several false bank notes with their photographic reproductions, the discovery and condemnation of the authors of which were due to photography. These forgers are now at Cayenne contemplating the extraordinary power of that science which discovered so easily what they had taken so much time and pains to hide. It may truly be said that "light" was thrown upon their actions!

In a former communication I stated incorrectly that the giant reflecting telescope of the Paris Observatory was the largest in the world. I intended to have said the most powerful. I should have corrected this error ere this, but happily the Editors, who are ever attentive to the interests of their readers, did so for me, as illness prevented me from holding communication with my readers as often as I could desire. Lord Rosse's reflecting telescope is six feet in diameter; but, although it is so large, it is a well-known fact among astronomers that the "*surface correcte*" is much less than either the Melbourne or the Paris mirrors. Another inconvenience is that it can only be pointed towards a certain portion of the firmament, whereas the Melbourne and the Paris telescopes can be turned in every direction. The telescope of Mr. Lassell is four feet in diameter; but it appears that this instrument has never produced images comparable with the two previously named. The mirror of the Melbourne telescope is of metal; that of Paris is of glass, silvered by the best modern process. Its surface is strictly parabolic. Glass possesses a great advantage over metal in the construction of mirrors for astronomical instruments, its power of reflection being much greater, and it can be much easier re-silvered than the metal mirror can be re-polished.

The several qualities of a telescope are its illuminating and magnifying powers, together with distinctness and field of view. All these qualities are combined in the new instrument at Paris. Large mirrors are superior to small ones, because they transmit a larger beam of light to the eye of the observer. Unhappily very much more light is absorbed by the metal mirror than is lost by passing through the lens. Metal mirrors will, ere long, be replaced by silvered glass ones—thanks to the perseverance, ingenuity, and study of the illustrious Foucault. The loss of light by reflection, says that *savant*, cannot be regarded as notable, for it is clearly proved that the polished silver surface of glass mirrors reflect $\frac{94}{100}$ of the incident rays, and experience has proved that this polish can be preserved for a very long time; in fact, were it not so, the re-silvering of a mirror at the present day would be a very easy operation.

3, *Place Bréda, Paris*, E. STEBBING, *Prof.*
*December* 7, 1875.

## HEATING BY GAS.

*To the* EDITORS.

GENTLEMEN,—I have been noticing lately the letters written by your correspondent "S. S. C.," who seems to have suffered many inconveniences from the use of a gas fire; but from the details he gives of the style of his fire I think I may be able to afford him a little information that will probably dispel his at present justifiable dislike to gas fires.

*Firstly.* He must excuse my saying so, but the idea of having only two burners to his grate is at once a sufficient cause of objectionable effluvia and failure, for there should be a burner *every two inches* of the distance between the two end cracks at the bottom of the grate.

*Secondly.* Instead of the burner being five-eighths of an inch in diameter a *little over* a quarter of an inch in diameter is sufficient, and care must be taken that the blow-through is made by two holes three inches below the top of the burner and on each side of the pipe, the holes being three-eighths of an inch in diameter—that is to say, the pipe must be *bulged* at that point; the proportion will, consequently, be about *two-thirds air* and *one-third gas* that is burnt.

The object of having so many burners, but so much smaller, is that, instead of being obliged to have such a force of gas turned on as to "worm" itself through the many interstices of the asbestos by a number being spread the whole width of the grate, by a modified pressure even, the cause of the heat is so well distributed that the whole of the asbestos is beautifully "reddened."

I should not have spoken so confidently as I have were I not in a position to speak of the main question from a business point of view, viz., *cost.* Now this did not matter to me so much, nor did it come definitely into my calculations, when having such a fire put up, but, having two placed in a drawing-room thirty-nine feet in length, I thought it desirable to have a separate meter for them, and an account of the consumption kept. On making a computation it was found that these fires, made on the principle I have described, cost very little more—if any more—than coal. At the same time I would state that never at any sime, *when carefully lighted* (the taper being placed just at the top of one end of the row of burners, almost touching the burner itself), has there been any smell discovered proceeding from these fires, and they have been generally much admired by all who have visited us.

At the same time I had one placed in my laboratory, adjoining the dark room. Being an amateur, I did not make the cost of it much of a consideration, but have since often examined the little meter, and can say with regard to this the same as I have said about the other two.

I am sure that if "S. S. C." will have his constructed on the same principle he will be much pleased with it, many of my friends having got, like "S. S. C.," disgusted with the wretched attempts at gas fires one occasionally sees—with burners that one's thumb would go into—have adopted the kind of which I speak. Mine were got from Messrs. Pettitt and Co., of London, who, on receiving the shape of the bottom of the grate with the "slots" cut in their proper position, will send a perfect apparatus ready for fixing. I shall be much pleased if I have given details that will render the fire of "S. S. C." a success and comfort instead of a nuisance. Messrs. Willway and Co., of St. Augustine's, Bristol, are the West of England agents.—I am, yours, &c.,

*Bristol, December* 13, 1875. H. A. H. DANIEL.

## PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

*To the* EDITORS.

GENTLEMEN,—Will you kindly allow me to ask photographers not to give money to men calling on them for relief, but to refer them to me. I am induced to ask them to do this on account of the doings of a certain individual, whom I have had sight of for nearly six weeks in different parts of the country, and nearly always with a different tale. He is an impostor, and has no more idea of working than he has of flying.

All cases of distress brought before this Association are investigated and relieved in a proper manner, therefore I hope photographers will send their loose cash to H. B. Pritchard, Esq., instead of giving it to the first "tramp" that calls.—I am, yours, &c., W. T. WILKINSON.

174, *Fleet-street, December* 13, 1875.

## "THE DISCOVERIES OF MR. M. CAREY LEA."

*To the* EDITORS.

GENTLEMEN,—A few words are necessary to close the correspondence between Mr. Howarth and myself. As it is merely a personal attack on me it is not necessary to prolong the discussion; but when he accuses me of "keeping anything in the background to receive pecuniary benefit from" I feel bound to protest against the utter falsehood of the accusation.

Up to about two years since I published everything with entire unreserve; but at that time a most unfair attack was made on me in your columns, and from that time I have cared little to publish. I have no "pecuniary benefit," in any way, out of photography; all commercial interest has been given up long since, and, as you are aware, my writings are those of an amateur.

I may now say that the contrast drawn between my "keeping my secrets for pecuniary profit" and Mr. M. Carey Lea's "generously giving your readers his writings" is singularly unfair. Mr. Lea has the distinguished honour of being a paid member of your staff, and, being such paid member, he writes as in duty bound, and we all owe gratitude to the enterprising Publisher of THE BRITISH JOURNAL OF PHOTOGRAPHY, who so liberally attaches to his staff, at much cost to himself, the highest available talent in photographic matters. No comparison can be drawn between a permanent member of an editorial staff who writes as such and a mere outsider who writes to try and benefit his co-workers.

Mr. Howarth asks if I will publish other things. May I point out that he is one of the very last men who can have a right to prefer such a request, having been convicted of a false statement regarding a previous publication of mine, when he said the keeping of an emulsion, through the action of nitrate of uranium, was discovered "months afterwards." This, as far as I am concerned, closes the correspondence.—I am, yours, &c. H. STUART WORTLEY.

*Rosslyn House, Grove End-road, N. W., Dec.* 13, 1875.

[Colonel Wortley's remarks regarding Mr. M. Carey Lea's connection with this Journal are, we think, singularly inappropriate. When Mr. Lea was induced to accept the post of American correspondent doubtless a satisfactory arrangement was made between himself and the Publisher of THE BRITISH JOURNAL OF PHOTOGRAPHY; but it is not for one moment to be supposed that Mr. Lea is *bound* by such arrangement to freely publish his discoveries. Mr. Lea, as an amateur, *gives* his experience for the benefit of his fellows, and has never in any way sought pecuniary recompense for his labours. If Colonel Wortley had always published the details of his discoveries with the same minuteness which characterises Mr. Lea's writings the above, and many previous letters, might have remained unwritten. With this letter we close the correspondence, as the matter appears to have assumed a phase not tending to edification.—EDS.]

## EXCHANGE COLUMN.

Tissandier's new *History and Handbook of Photography*, perfectly clean, only just bought and read, will be exchanged for Hardwich's work on photographic chemistry (*Chemistry of Photography*).—Address, THOS. MOORBY, 97, Clarendon-street, Hull.

I will exchange any of the following for articles useful in photography:—Five-guinea Franco's printing-office, Cusson's posing-chair, antique oak chair, half-plate dry camera and changing-box. Other articles to offer.—Address, HOLGATE, photographer, Bingley, Yorkshire.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

*** Several Reviews in our next.

J. ROARTY (Brickfield Hill, Sydney, New South Wales).—Your P.O.O. to hand. Thanks.

B.—There is no work specially devoted to the chemistry of gelatine as applied to photography.

JAMES ROBERTSON.—There is no work published on the manufacture of photographic lenses.

M. CAREY LEA.—Received just as we are going to press. The mail, we presume, has been delayed. Will appear in our next.

S. U. R.—We are unable to state the "best proportions" in which to add chrome alum to gelatine so as to render it insoluble. It does not, however, require much to effect this object.

B. B.—Mr. Shadbolt is still living, and enjoys excellent health. If you wish to communicate with him we shall have pleasure in forwarding your letter, but we must decline to publish his address.

W. M. RENNY.—The form of studio you propose will answer very well. The ridge may be in the centre. The slope of the roof should be such as to prevent the rays of the sun from obtaining access to the interior.

J. G. F.—It is clear that in the case cited by you the want of intensity is owing solely to the quality of the pyroxyline. The only palliative we can suggest is to use a larger proportion of nitrate of silver in the developer than usual.

RUPERT MATTHEWS.—The general rule to be borne in mind is that alcoholic varnishes require the aid of heat, otherwise the surface of the negative becomes chilled, appearing somewhat like ground glass. There are isolated exceptions to this, although, as a rule, it is correct. Benzole varnishes do not necessarily require heat; one of the best of this class is a solution of dammar in benzole.

W. CONGREVE.—Before supplying the information desired it will be necessary to make us acquainted with the nature of the illustrations required. For instance: do you wish photo.-surface blocks for printing along with the type, photo-lithographs printed at a separate press, or, finally, photo-collotypes for showing half-tones and gradation? All of these are used for book illustration, but each requires an entirely different method of procedure.

C.—We have frequently seen old almanacs of the kind you require sold at sale-rooms. We fear that you can only obtain it at present by advertising. There is no photographic library of the description of which you speak. The process of M. Despaquis was published in this Journal last summer.

W. DANIELS.—You may proceed by digesting metallic cadmium with iodine and water, although this is a tedious and unsatisfactory process. A better way is to dissolve in water twenty parts of iodide of potassium and fifteen parts of sulphate of cadmium. When evaporated a white crystalline mass is obtained, and absolute alcohol added, by which a solution of iodide of cadmium is obtained; the other product of the decomposition, sulphate of potash, is insoluble in alcohol.

MAJOR SCOTT.—Your query is based on the assumption that we are acquainted not only with nearly every lens manufactured at present or in the past in London, but also with their stops. This is so far from being the case that we have no idea whatever of the relative values of the stops you have enumerated. We give you the best advice in our power when we say—Use the stop which best gives you the required definition, bearing in mind that the smaller the stop the longer must be the exposure. As your subject is inanimate it will be prudent to use a small stop and give a long exposure. Insert the stop on the use of which you have determined, and then adjust the focus.

J. P. D.—As you are not in a position to weigh small quantities with accuracy make your toning bath in the following manner:—Pour into the toning dish as much water "with the chill off" as will suffice, which in your case will be about six or eight ounces; pour into this half-a-drachm of your diluted chloride of gold solution, and, when well mixed, place in the liquid a small scrap of litmus paper. This will immediately turn of a red colour. Next add, with stirring, a few drops at a time of a somewhat weak solution of bicarbonate of soda, the strength being immaterial, until you observe that the red colour of the litmus paper changes to a pale blue colour. The solution is then ready to be used immediately.

S. SEALEY.—Do not annoy yourself by "doctoring" the silver bath any further, but treat it as incurable and proceed as follows:—Pour out the solution into a deep glass jar, and immerse therein a broad strip of copper. Instantly this copper will be seen to become of a dark colour, owing to the deposition on its sides of metallic silver in a state of minute division, which speedily accumulates to such an extent as to fall off by its own weight, becoming deposited at the bottom of the vessel. This action continues so long as there is any silver remaining in the soluble form. After the action has ceased the metallic silver is found at the bottom, some of it remaining loosely attached to the copper, from which it may be brushed off. The supernatent fluid consists now of nitrate of copper. Wash the silver by a few changes of water, and fuse it as a button, or dissolve it in nitric acid, according as you desire to retain it in a metallic form or as nitrate of silver.

ENTOURAGE ARTISTIQUE.—Mr. J. Solomon, of Red Lion-square, has shown us a variety of tastefully-executed portraits and groups in cabinet sizes, the peculiar feature of which is that they form the centre-piece in an artistic framework—an '*entourage artistique*'—printed upon the picture by means of a second negative. The composition and execution of these artistic surroundings are by Mr. Payne, of Aylesbury, Mr. Solomon being the agent for the sale of negatives. They cannot fail of securing a large share of appreciation from photographers, the designs being varied and in themselves exceedingly tasteful. Of course, a due amount of discrimination must be used in the selection of suitable borders for the various descriptions of pictures. They form an excellent Christmas novelty.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.—The ordinary monthly meeting of the Board of Management was held at 174, Fleet-street, on Wednesday, the 8th instant,—Mr. W. S. Bird in the chair. The minutes of the previous meeting having been read and confirmed, Messrs. Evans, Dighton, Loysdon, Boucher, Thomas, Harnack, Dennis, and James were admitted members of the Association. The Secretary was instructed to write and thank the President and Council of the Parent Society for granting the exhibition on the 18th ultimo. The Board then discussed the date and matter for the annual social entertainment, and the Secretary was instructed to arrange for the Co-operative Hall, about the 24th of January. In reply to questions, the Secretary announced that Mr. E. Cocking would again undertake the musical portion, Mr. York the magic lantern exhibition, and he (the Secretary) would be the lecturer. He (the Secretary) brought forward a petition for relief, which was supported by several members. After a discussion it was decided to grant the sum of ten shillings per week, for a term not exceeding ten weeks, and to allow the applicant to advertise in the employment register issued by the Secretary. As the applicant was not a member it was decided that at an early meeting the Board would consider whether it was not desirable to give notice that, after a certain date, relief would not be granted to non-members.

CONTENTS.

THE BRITISH
# JOURNAL OF PHOTOGRAPHY.

No. 816. Vol. XXII.—DECEMBER 24, 1875.

## SUGGESTIONS IN CONNECTION WITH PHOTOGRAPHIC RÉUNIONS.

Of the numerous photographic societies which exist at the present day, not only in the metropolis but throughout the whole country, the majority make a practice of holding, at least once a year, a sort of general meeting of a social nature, in which not only members but also their friends of both sexes are enabled to take part. These *réunions*, as is but natural, take many different forms, varying from the simple lantern-exhibition to the more general *soirée* or *conversazione.* Still another kind of gathering of a practical but scarcely social nature is the one instituted last year by the South London Photographic Society, under the term of "technical meeting." Having been in many ways connected directly and indirectly with the getting-up of such affairs, and having been in personal communication with others so engaged, we are able to speak of the difficulties attending the operation, and how they may be to a considerable extent mitigated; while, at the same time, we shall tender a few words of advice to those who may during the season find this work thrown upon their shoulders without the necessary experience to carry them through their delicate task.

As a matter of course, the first consideration is the style of entertainment it is proposed to offer. Here, as we have said, there is great variety of choice. The simplest as well as least expensive form is, of course, an exhibition of photographs by means of the dissolving or single lantern; but this, though amusing and at the same time instructive, is scarcely worthy of being classed in the category of annual displays. It is, indeed, with some societies not an annual but a much more frequent custom; but as we have recently treated the subject of such exhibitions we may pass on without further comment.

Another and more general form of entertainment is that which passes under the generic titles of "*soirée*" or "*conversazione.*" The basis of this style of gathering is, of course, a sort of promenade through a *suite* of suitable rooms, which are hung with the best examples obtainable of every branch of photographic art, whilst the tables and other available spaces are furnished with many samples of scientific appliances or apparatus either wholly or in part applicable to photography. In addition to this it is frequently the practice to introduce, at stated intervals, in a room reserved for the purpose, short lectures or papers descriptive of some operation or process which is likely to be of interest, or practical demonstrations of a nature to prove instructive on accoun of novelty or difficulty of manipulation. It is upon the judicious blending of the various departments that the success or otherwise of the undertaking depends.

With regard to the objects exhibited, be they pictures or apparatus, care should be exercised in the selection. "Circumstances alter cases" most materially; and what might prove of the highest interest in an out-of-the-way provincial town would probably be sadly out of place in the metropolis, or in any of the great business centres, which are now-a-days scarcely behind London in the supply of novelties. First, as regards pictures: we should recommend quality rather than quantity. We have seen, on the occasion of these annual *soirées*, the walls covered and the tables heaped-up with piles of pictures which have been well known at exhibitions for probably six or eight years, and which by their number hide, or render it extremely difficult to pick out, the few new ones which may happen to be present. This is not as it should be, and it is, we think, equally to the interest of the exhibitor as well as of the promoters to see that the exhibits are such as are calculated to afford pleasure and instruction. With this view we would counsel secretaries and committees, in asking for objects for exhibition, to apply only to those members of the fraternity who have become celebrated in any particular branch of the art, requesting those to whom application has been thus made to send only such examples as really do them credit; the mere occupation of so many square feet of space is not sufficient to satisfy even provincial critical discrimination.

Another class of exhibits which we should like to see, and which might, we think, with profit be extended, is that including apparatus of all kinds, but principally of a novel description. We scarcely think that the occasion of such an exhibition as we are speaking of warrants a manufacturer in sending a piece of apparatus whose only recommendation is mere excellence of workmanship; that is a recommendation more suitable in an industrial exhibition, where the principle is one of competition. The object in the case of which we are now speaking should be to instruct—to set before the eyes of those who may not otherwise have the opportunity of becoming acquainted with it the advantages of any recent novelty; and in doing so the reward is found not only in the shape of the publicity thus given, but also in the fact that "ocular demonstration" is frequently a great aid—in particular cases superior—to other forms of advertising.

But the exhibition of apparatus need not be confined to manufacturers. There is scarcely a society in the kingdom, more especially amongst those who are not in the habit of holding outdoor meetings, whose members cannot muster some few articles which may prove novelties to, at least, one or two of their fellow-members; while the non-photographic public will generally be found to exhibit a curious interest in the, to them, mysterious tools of the photographer. Besides apparatus properly so termed there must be in almost every studio some little coutrivance or invention a model of which, or even the original with all its marks of wear and tear, could not fail to convey a "wrinkle" to some one.

The next class of objects includes those which are usually described in the language of the reporters as being "on the tables." These consist of stereoscopes of every form and description, graphoscopes, microscopes, or apparatus for the study of light in its various forms, such as the spectroscope and polariscope. The two first of these need no comments from us; though so well known they never fail to prove popular, especially among the young folks, who are also partial to a peep into the microscope. For the more scientific of the visitors the microscope forms an endless source of interest, but should be presided over by some willing mind competent to explain to the uninitiated the difference between *diatoms* and *foraminifera*, and to prevent the members of the different families of *Pulex* from being mistaken for curiously-formed lobsters. The same remarks apply to the two last-mentioned instruments on the list; for, in addi- on to the superior interest attaching to the study when accompanied

by a lucid description, it is scarcely wise to trust a delicately-constructed and expensive instrument in the hands of an ignorant and, perhaps, not too careful person.

Lastly: a word or two regarding the delivery of lectures. In case the delivery of a lecture be deemed advisable the first requirement is brevity, in order not to encroach too much upon the other portions of the programme. Let there be, rather, two or three, or even more, short *lecturettes* at advertised intervals during the evening than one long one, which is certain to tire out the audience, especially the ladies. Then, the subject should be of general interest, but not too technical; but we consider it scarcely possible to engage the interest of both photographic and non-photographic hearers simultaneously, and, at the same time, to make the subject-matter valuable. A more likely course to afford amusement and to give instruction lies in the exhibition of scientific experiments or the demonstration of any of the usual photographic operations. Under the former heading we may name any of the ordinary electrical experiments or the combustion of metals, &c.; while, by special adaptation of the lantern, it is possible to exhibit to large audiences the operation of development.

The minor matters relating to the introduction of music and such forms of amusement into this class of entertainment need not be here discussed, but must depend upon the habits and idiosyncracies of those most concerned. One word of advice, however, to ensure complete success:—Let the refreshment department be well furnished and under good management.

In conclusion: permit us to address a few words to the exhibitors, whether they be amateur or professional; those of them who have joined in the promotion of one of these entertainments, and who act upon the precept, "Do as ye would be done by," will not need the advice. To those who are strangers to the work we would say—"You do not know the trouble that committees have under such circumstances, nor the labour which falls upon the poor secretary. Have mercy on them, and if applied to write at once and state your willingness or otherwise to comply with the request; send forward your goods at the precise time named, and see that the cases are correctly addressed; and, above all, do not write the day after the entertainment requesting that your package may be returned *immediately*." By attending to these directions the favour you confer by your contributions to the exhibition will be considerably enhanced. And the secretaries and committees, on their side, should see that all objects entrusted to them are taken care of while in their possession, and returned, if not "immediately," at least as soon as they can be packed. They will thus in all probability secure a contribution for the following year.

## SOMETHING MORE ABOUT THE OXYHYDROGEN LIGHT.

Notwithstanding all that has been written about the lime light the question again and again crops up in one or other of its various forms; and in spite of the extreme simplicity and, when properly conducted, perfect certainty of all the operations connected with its production, operators are very far from being at one on various points connected with it. Several of these points have recently formed the subject of a rather animated discussion elsewhere; and, as the statements made by the various writers were either simply matters of opinion or conclusions arrived at on theoretical grounds, we resolved to institute a series of practical experiments, which—although they may not be of much value to experienced operators—will at least form the basis for the settlement of most of the disputed points.

Presuming that the source from which the oxygen is obtained is the ordinary mixture of potassium chlorate and manganic oxide, and taking for granted that the manganese gives up none of its oxygen, or at least so little as to be left out of consideration, our attention was first directed to a careful measurement of the actual quantity of oxygen evolved by the ordinary method of decomposition.

Potassium chlorate, as is evident from its formula, $K\,Cl\,O_3$, is made up of 35·5 parts by weight of chlorine, 39·1 of potassium, and 48 of oxygen, and as it is entirely converted into potassium chloride, ($K\,Cl$) by heat, each 122·6 parts of the potassium chlorate should yield forty-eight parts of oxygen; or, to put it in a more convenient form, each pound should give exactly six ounces two hundred and thirty-six grains—equal, at ordinary temperature and pressure, to 4·42 cubic feet. Some operators are under the impression that they generally get a larger quantity of oxygen than this, while others believe that they rarely succeed in decomposing the whole of the chlorate; but the ordinary method of measurement, by calculating the capacity of the gas bag, is extremely unsatisfactory, and, therefore, little reliance can be placed on results so obtained.

With a view to ascertain somewhat correctly the actual quantity evolved in practical operations we obtained, through the kindness of the manager of one of our gas companies, two very delicate gas meters, through both of which we passed the gas resulting from the decomposition of five different charges of one pound each of the potassium chlorate, and three ounces and eighty-eight grains of manganic oxide, one-fifth being the quantity that in previous experiments we had found most advantageous. The retort was made of thin sheet iron and conical in form, measuring five and a-half inches at the base, seven and a-half in height, and having a containing capacity of forty ounces. The source of heat was a *rose* Bunsen's burner, consuming 4·8 feet per hour—this small burner being, we think, much better than the larger sizes when quantities of not more than one pound are to be operated on—the decomposition going on gradually without any necessity for removing the flame and interruption to the flow of oxygen. The result of the five operations carried on in this way was that they gave a mean of 4·25 feet per pound—a difference of only 0·17 from the theoretical quantity, so that, practically, we may consider that the whole of the chlorate had been decomposed.

The next question was as to the relative value of pure hydrogen and ordinary coal gas, as, although the latter is now generally used, we know there are some operators who take the trouble of making the former, under the impression that it gives a more brilliant light. Two bags were filled—one with oxygen and the other with pure hydrogen—and placed each under a pressure of fifty-six pounds. The jet was one of those in which the gases are mixed before reaching the burner, and the hole in the latter measured $\frac{3}{100}$ of an inch—a size considerably smaller than we are in the habit of using, but chosen purposely to suit the limited space at our disposal in which to separate the photometer screen from the light.

The gases were carefully adjusted till the light was at its best, and its value was then ascertained by a modification of Bunsen's photometer, in which the candle was fixed at a distance of one foot from the screen, and the two together moved away from the light until both sides of the disc were equally illuminated. This was repeated very many times, and examined by various observers, the result being that a mean of all the observations gave the value of the lime light, under the above conditions, as 115·5 standard candles. In the next experiment coal gas was substituted for the pure hydrogen, and, somewhat to our surprise, the result was not to any appreciable extent different, the light being, both as shown by the photometer and in the judgment of those by whom we were assisted, in every respect equal to that given by pure hydrogen.

Between each of the gas bags and the burners we had introduced one of the gas meters, and carefully noted the relative quantities of gases consumed, the result being that with pure hydrogen it stood—oxygen 1, hydrogen 1·3; and with coal gas—oxygen 1, hydrogen 1·1. We are aware that there is a very general belief that the proportions in which oxygen and hydrogen combine to form water ($H_2O$) are those which ought to give the best results in raising the lime cylinder to the incandescent state; but those who have had much practice with lime-light exhibitions, where the bags have been of nearly the same size, know very well that the hydrogen bag, especially when coal gas is used, does not get empty much sooner than the one containing oxygen. What may be the true explanation of the apparent anomaly we are not at present in a position to say; but the result of the somewhat careful measurements above recorded is quite in harmony with the opinion that we had formed from our experience with the practical working of lantern exhibitions.

Of course it will be understood that in bringing the light up to only 115·5 candles we were not seeking to produce the best effect that could be obtained, but only the best under the conditions named, with a view to comparing the pure hydrogen with coal gas; and we may say that on increasing the orifice of the jet to ·08, and doubling the pressure, we more than quadrupled the illumination, and when it was passed through the ordinary lantern condenser it was roughly found equal to about 405 candles. To get at that estimate, however, the candle was fixed at only two inches from the photometer screen, and therefore there was some difficulty in deciding the precise distance from the light at which both sides became equally illuminated.

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The return once more of "Yule-tide" reminds us not only that we are advancing in years—that, speaking journalistically, we are about to complete another volume—but also that we have a duty to perform—a pleasant duty withal. We look back upon the past year, or so much of it as is already past, with feelings of satisfaction; for, though the discoveries made have not been very startling, still it has been a year of quiet, steady progress. And looking back we cannot but feel grateful to our many contributors, not only in this country but in nearly every part of the globe, for the kind and active assistance which they have rendered us in our attempt to keep up a current account of the state of photography in all its branches. How far our attempt has been, with their assistance, successful we are content to leave our readers to form their own judgment; but in expressing our thanks to those who have worked with us we must express the feeling of our own inadequacy to the task, had we been deprived of the valuable co-operation of so many friends whose names stand high in the annals of our art-science. To those friends, as well as to the non-contributing portion of our readers, we extend at this festive season the hand of good-fellowship, wishing them the compliments of the season—a Merry Christmas, and a Happy, Prosperous New Year; trusting that they and we may (in the spirit at least) meet on many similar occasions in the future, and assuring them that on our part no exertion shall be spared in keeping The British Journal of Photography up to its previous standard as—*the* Photographic Journal of the day.

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## ALKALINE DEVELOPMENT.

Although very much that is interesting has been published within the last few years on the subject of alkaline development, the information given has been for the most part as to the particular treatment found best with various kinds of plates. Not much has been contributed on the subject of the general principles of the operation, and in this respect the knowledge possessed of alkaline development has been always less than in the case of wet or acid development. I have made some investigations lately in the endeavour to throw more light on this part of the subject, and propose in this paper to give in a brief way the conclusions that have followed.

There are three points which I have more especially examined:—First, what means we have in the alkaline development to combat the effects of under-exposure and excess of contrast; second, what to combat over-exposure or deficiency of contrast; third, when we resort from preference (not necessity—with a good emulsion there is never a necessity) to an acid redevelopment, at what point we should break off the alkaline. The first two of these points have received occasional attention—the latter, I think, scarcely any.

1. How under-exposure is to be remedied (and evidently similar conditions will be needed in the case of a subject involving excess of contrast, as when we have to do with light objects highly illuminated and dark ones more or less shaded; in either case the object is to subdue contrast). It has, I think, been an opinion that, in using the ordinary or weak alkaline development, the proper method of controlling contrast is by using a "graduated" development, keeping the high lights thin, and so giving time to the details to come out before the high lights become too dense, on the ground that if a too rapid development were employed printing density would be reached before the detail in the deep shadows could show itself. I have long had doubts if there were any truth at all in this view, and it seemed worth while to settle it definitely by careful experiment.

The first question which presented itself was how the high lights could best be kept thin during development. After comparing various methods, the best was found to be a development with a very small proportion of pyrogallol. Thus—

| | |
|---|---|
| Water | 4 ounces, |
| 60-grain pyro. | 5 minims, |
| 30-grain bromide | 20 ,, |
| 80-grain ammonium carbonate | 20 ,, |

will bring a plate out slowly, and unless the exposure has been a very full one the high lights will remain very thin for a long time. For comparative trial three plates were next exposed on a very difficult view—strong lights and deep shadows, with a clear sky and no aid from reflection. Each had an equal exposure.

One plate was developed in the manner just mentioned, continuing the action of the developer for about fifteen minutes, when it was completely spent. The plate was then redeveloped with acid silver. The second plate was entirely carried through with the alkaline developer, using—

| | |
|---|---|
| Water | 4 ounces. |
| 60-grain pyro. | 20 minims. |
| 80-grain ammonium carbonate | 20 ,, |
| 30-grain bromide | 20 ,, |

Printing density was reached in about three minutes. In the third plate the alkaline development was carried through one-half, was then broken off at the end of a minute and a-half, and was redeveloped with acid silver.

On comparison of the three, the two last plates showed about an equal amount of detail, indicating that no special gain in detail is obtained by carrying the alkaline development through, rather than by redeveloping with acid silver. But both showed materially *more* detail than the first, so that detail is diminished, not increased, by that method, thus clearly indicating that the use of a prolonged development with weak developers to get detail is erroneous in principle. The result is an exceedingly clean, bright plate, but with black shadows; that is, the deepest shadows are bare glass, without detail. My own habit for years has been, when I thought a plate under-exposed or with a subject presenting difficult contrasts, to use warm water and a larger proportion of pyrogallol than usual, finding, as I have elsewhere remarked, a power in pyro. when thus employed to force out detail. These recent trials confirm me in the opinion that it is the right way, and that no good result can come (except in cases of over-exposure) from a slow and careful development, although such has been occasionally advocated ever since the days of the calotype.

2. In cases of over-exposure this slow development would undoubtedly be useful when the fact of over-exposure was known in advance. Often this is not the case, but when it is we are mostly saved by the latitude of exposure possessed by all good sorts of dry plates. When, however, the application of a developer of twenty minims each of the foregoing solutions (or any ordinary alkaline developer) brings out the image flashing up at once, then there is a clear case of over-exposure and the question is how it shall be treated. Several plans may be adopted. The plate may be instantly washed off, and be treated with the same developer with a double portion of bromide, or the developer may be instantly diluted. But perhaps as good a plan as any is to let the image reach about half intensity, and then fix it and redevelope it with acid silver solution. If other plates remain that have been similarly exposed, they may be developed with a half dose of pyrogallol, and, if the over-exposure has been considerable, an extra dose of bromide.

Admitting these views to be correct, they bring the wet and dry developments into very close relations as to principle. Years ago, in the columns of this Journal, I assisted in establishing those laws which govern wet development, and the views then expressed have passed, if I am not mistaken, into general acceptance. They were—that a strong (wet) development gave softness and detail; a weak one, brilliancy and contrast. Consequently, that an insufficiently-exposed plate, or one presenting sufficiently-strong contrasts to make the subject difficult, should receive a strong development; an over-exposed plate, or one representing a subject deficient in contrast, should receive a weak development, in which, however, there was to be as much restraining acid as in the strong. I believe the principles of alkaline development precisely to correspond, and, if so, the recognition of the fact becomes an important aid to those who, familiar with the wet process, begin to work with the dry.

The admission of the principle that an under-exposed plate needs a developer strong in proportion to its under-exposure naturally leads to and explains the fact discovered by Colonel Wortley—

that a plate that has had a very brief exposure can have its detail brought out by using an extremely powerful development, though it seems that, when carried to this extreme length, the principle is not of universal application, some descriptions of plates refusing to do well under it.

3. There remains the third question. When it is proposed to end with an acid redevelopment, how far should the alkaline treatment be carried, in order to get the best results? To examine into this matter I have stopped the alkaline development at various stages, and the conclusion reached is almost the reverse of what would be expected *a priori*. It is that *the sooner the alkaline development is stopped and the acid begun, the softer is the resulting image.* If the alkaline treatment is allowed to bring out a faint image only, and the plate is washed off (without fixing, of course) and redeveloped with acid silver, the resulting image will be very soft—softer than if the whole development be made by alkali, by a good deal; and just in proportion as the alkaline development makes a larger proportion of the whole treatment so will the resulting image show more vigour. To this principle there is an apparent contradiction, but one which is in reality a confirmation.

A plate redeveloped with acid silver will, if it have had a full exposure, show more detail in the high lights than if the development had been finished with alkali. The alkaline development is the more powerful treatment of the two, and gives intensity to all the more strongly-impressed parts, whilst the acid silver spaces them out better. Thus, if we suppose three half-tints which with the acid silver represent 80, 90, and 100 (100 being full opacity), the alkaline development may carry these up respectively to 90, 95, and 100; and it is the very fact that in alkaline development all the well-lighted parts take so much density which makes the general contrasts stronger in these plates than in the redeveloped ones.

The general principle here stated enables us to judge when we had best apply the redevelopment; for, if the subject show harsh contrasts, it will be best to cut short the first development at an early stage, whilst in the case of over-exposure it will be best to use but little redevelopment. These remarks refer of course altogether to *redevelopment before fixing;* redevelopment after fixing is a very different thing. The operation of fixing before redevelopment increases contrast in two distinct ways:—First, it destroys any impression of light that may not have been acted upon by the first development (because it removes the haloids that received it); and, secondly, it always dissolves out some of the delicate faint tints, so that the preponderance of the stronger becomes more marked.

This may be easily exemplified by referring, as before, to a scale of tints. Supposing that before fixing the principal tints are represented by the scale 1, 2, 4, 8, 16, 32, &c., and that the fixing solution dissolves out a quantity represented by 2, then the scale becomes 0, 0, 2, 6, 12, 30, 62, &c. Though somewhat exaggerated, this may serve to give an idea of what takes place. The matter, however, is almost too plain to require illustration. It is evident that a further development upon the second of these scales will lead to a series of wider differences than if applied to the first, even allowing for the final modification of the first by the fixing operation.

And if we compare three characteristic cases—first, development finished with alkali; second, development made half with alkali and half with acid redevelopment, fixed afterwards; third, development made half with alkali, then fixed and redeveloped with acid—we shall find the second showing *less*, and the third *more*, contrast than the first. M. Carey Lea.

## ON A NEW FORM OF GLASS ROOM.

Before saying anything about new designs for this most important construction let us see what qualities we have in those already in use, and also what are their shortcomings. It is an understood thing that one glass room is more suitable for *one* particular class of photographs than another, and that no studio possesses the qualifications *most* suitable for *all* kinds of photography. With a certain amount of trouble and skill good pictures can be made in any studio, but no skill can in *all* studios regulate the temperature at will.

The qualifications a good studio should possess are—that the light should be of the best quality and easily regulated; sufficient space for convenience; a comfortable and equable temperature, winter and summer; and last, but not least, be as inexpensive in construction as is consistent with durability.

A small studio with the glass near the sitter is well known to be one in which the most rapid and effective pictures can be taken, the rapidity of the work decreasing with augmentation of size; and a small studio all glass is, as many perspiring operators can testify, almost unbearable in hot, sunny weather, and is unpleasant in winter, if heated even by a stove. A great many studios are of this kind, exigencies of situation and cheapness of construction having been the ruling ideas.

As far as comfort goes the ridge roof, with brick or stone walls on the south side, is, perhaps, as good as any. This form, however, necessitates a background at both ends, or the styles of lighting must be very limited. Glass on both sides is most convenient, and will permit all kinds of lighting with one background, but with the drawback of such an excess of heat during a hot summer that the advantages of this style of building are often sacrificed to the less convenient north light and brick south wall.

In the suggestion I am about to make I will presume the building is not a mere question of expense—still no greater expenditure is to be incurred than is absolutely necessary. I may here say the idea did not originate with me, but cropped up in the course of a conversation with a gentleman who had considerable experience in building studios. It is this:—That the *back* of the studio should be constructed on the principle of an air-shaft, so that the over-heated air is removed as soon as formed, a regular current being automatically established by an arrangement which the following diagrams will explain:—

FIG. 1.

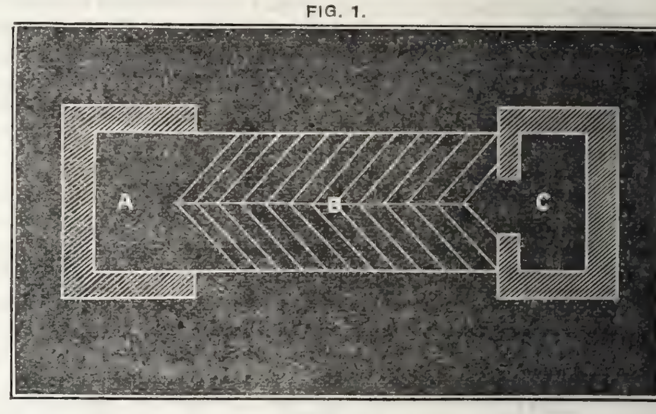
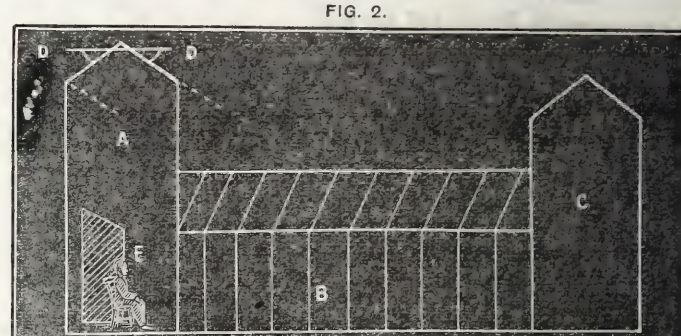



FIG. 2.




*Explanation.* A, end studio walls, to be built of brick or stone, rising at least twice the height of glass portion, B, and containing ventilators, DD, to be opened or closed at will. C, dark room. E, background and sitter. It will be seen that the position of the sitter with regard to the light is precisely the same as in an ordinary glass room, the lighting being regulated by blinds in the usual way; but, instead of having to sit in a scorching heat, as is the case with a *low* glass roof, he is placed in a *cool* room with all the advantages of a low light. This brick or stone air-shaft can vary in size of area to suit the pocket of the artist. It can, in fact, be quite a large room, sufficient to hold all the spare *matériel* and accessories of the establishment; the larger the better, the only restrictions being that it must be lofty, cool, and dark. As to any other matters they are at the discretion of the photographer. Edward Dunmore.

## ON THE MANIPULATION OF LARGE PLATES IN THE FIELD.

[A communication to the London Photographic Society.]

I must confess myself to be in a predicament, as I am asked to say something about the taking of the large direct photographs in the late Exhibition, and really I have nothing to say. I do not like to begin thus; and yet I am afraid that the following particulars will be voted not a twice but a many-times told tale.

With regard to the chemicals employed in producing the negatives I have made no change from the various formulæ I gave last year in the paper I read before you; but the increase of size from 13 × 11 introduced some modifications in the manipulations.

And here I would wish to remark, with reference to the question of direct photographs *versus* enlargements, that, when the size of the picture does not much exceed the dimensions mentioned, a much better result can be secured by taking the negative direct than is possible by any enlarging process yet known. But when the size is beyond 24 × 18 then an enlargement becomes a necessity.

The difficulties attendant upon the taking of large negatives by the wet collodion process are more in the bulk and weight of *impedimenta* required to be carried and moved about than in the manipulations themselves. When the knack has once been mastered it is just as easy to coat a plate 20 × 16 as to coat one of a smaller size; and the same observation is equally true of the development and varnishing.

Last year I stated that I found an omnibus more convenient than a tent; but I discovered that a covered vehicle was not so well suited for these large plates. One great help to successful working is to have plenty of elbow-room. Some pride themselves upon being able to conduct their operations in the most limited space; but I believe it to be a mistake.

The tent I used during last summer's campaign will be well enough known to you by the name of "Smartt's tent." It consists of a few light pieces of wood, which are quickly fitted together, and made rigid by sundry screws. When erected it looks more like the stall of a peripatetic vendor of gingerbread than anything I can think of. Over this framework is thrown a covering of the twilled material generally used for dark tents, which is pinned down to the ground with iron skewers. From each upper corner of the tent hangs a cord, which is also secured to the ground with an iron pin. This prevents the tent from being blown over by the wind.

My assistant puts this tent up and takes it down again in a very few minutes—say ten. This is done while I get the camera, &c., in order or select a suitable point of view. When erected the tent forms a commodious and airy dark chamber 7 feet high, 3 feet deep from front to back, and 5 feet 6 inches wide. A mahogany board, hinged in the middle for portability's sake, goes all along the tent, giving a surface to work on of 5 feet 6 inches by 2 feet. Above is a shelf, also hinged, which gives ample room for all the bottles, &c. Such a tent is easily made, is roomy, cool, and comfortable, and packs up into two comparatively small and by no means heavy packages.

From the tent we work in to the camera we work with seems a natural transition. Mine, made specially with a view to portability and careful usage, weighs about half-a-hundredweight. To shift such an instrument as this from place to place in the ordinary way until the picture on the ground glass is suitable, would be so laborious as to be a serious obstacle; but by the adoption of a simple expedient such fatigue and loss of time are quite done away with.

There is an analogous difficulty in the use of a large telescope; and to obviate it a small telescope, called a "finder," is fixed in such a position that the same object occupies the centre of the field of view in both instruments.

Acting upon the idea this suggested, I took a 5 × 4 camera, and mounted it with a lens that embraced just the same amount of subject as the large one, the image on the ground glass of the small camera being a reduced *facsimile* of that on the large one. Thus provided, I could with great ease make several trials, until at length I had satisfied myself that I had fixed upon the very best point of view from which to take the picture.

This important matter decided, the tripod stand that carries the large camera is next fixed up, and the top accurately adjusted to a horizontal position by means of a spirit-level.

A Stillman's camera resembles a closed book. In the lower part of it is cut a groove, into which a projection on the brass ring forming the tripod top accurately fits. The camera being lifted up is placed with great ease and certainty in the required position, and then clamped by means of the usual screw. Two pieces of brass are raised, the front and back of the camera fall like the covers of this book, and all is ready.

We come now to the preparation of the glass.

In coating a plate the whole secret of success lies in keeping the pool of collodion quite circular, and as nearly as may be in the centre of the plate. If this be done all is easy enough; but if from careless pouring the fluid be allowed to run into an oval or any irregular shape, then an imperfectly-coated plate or a waste of material is inevitable.

I hold the plate by means of a globe pneumatic plate-holder from which the handle has been removed. It is extremely convenient to put the collodion into a suitable pourer that will contain just the quantity necessary to flow the plate properly, and no more. For the size 20 × 16 I find two ounces is just sufficient; and this is the quantity I always pour on the plate, thus preventing any mistake by taking too much or too little, which is almost sure to occur when pouring from a larger quantity. Moreover, there are obvious reasons why this method is best when immaculate plates are desired.

*Development.*—I prefer to develope by pouring on the developer in the usual way. I have tried the development dishes recommended by Mr. England and others, but I found them messy and troublesome. There is really no more difficulty in applying a developer evenly to a large plate than there is in collodionising it; but as the weight of the sheet of glass is considerable, one's arm soon begins to cry out for rest, and so I avail myself of a little expedient devised by our friend Mr. B. J. Edwards, to which I gladly take this opportunity of calling attention. Take a good heavy pickle-jar, and into the neck of it insert a hollow india-rubber ball (those used in the game of lawn-tennis are just the thing); this forms a soft, circular pad, on which the plate is instantly moved into any and every position with the greatest ease. On taking the plate from the dark slide place the centre of it on the ball; support the nearest left-hand corner with a pneumatic holder, and apply the developer with a clean and even sweep. Nothing could be easier, and, thanks to this simple yet admirable contrivance, a large negative can be rocked or held just as easily as one of half-plate size.

I should not have ventured to occupy your time and trouble you with these small points were it not that had any one else written out these few hints I should have been saved much trouble in finding out the best and easiest way. Our manuals, numerous as they are, say scarcely anything about working large plates.

I do not remember having seen it recommended that a duplicate negative of an away-from-home negative should always be taken; the extra trouble is comparatively nothing when the point of view is chosen, the object properly focussed, and the camera in position. Accidents will happen; and the larger the negative the more liable it is to fracture in the pressure-frame. The more distant the view, and the more difficulty there is found in securing a satisfactory result, the more important it is to take a duplicate. Moreover, perfect as the first negative may be, the chances are that the second one will, in some respect or other, turn out to be superior.

It is an unfortunate fact that every photographer meets with failures. My special trouble this season was the splitting off of the film during the final drying. What more exasperating source of failure is there than this? A large negative of a distant object is successfully taken, and every operation successfully carried out up to placing it in the rack to get dry; then to come next morning and find the film hanging down in ribbons is, to say the least of it, very trying to the patience. Fortunately I was able to trace out the delinquent and convict him on the clearest evidence. The collodion was guilty. I was very sorry for it, because of the many good qualities this sample possessed. It flowed over the plate in the most agreeable manner; it gave in the bath a splendid creamy film, which was of the utmost sensitiveness, and which, under the developer, densified admirably. But this one fault ruined all; and so, in spite of all his virtues, he had to go into banishment. What struck me as extraordinary was that, when employed upon small-sized plates, or even up to 13 × 11, it exhibited no tendency to this propensity. I thought at one time that unequal drying was the cause; but it was not. I tried a substratum of albumen of different degrees of strength and even supplemented that with a broad line of india-rubber varnish, but vainly—the film peeled off just the same; yet albumen proved to be the curative agent after all. After the final washing I applied the albumenising solution after the manner of collodion, worked it well over the plate, drained off the surplus, and put aside to dry. Negatives so treated did not split. Gum water has been proposed for this purpose; but it is objectionable in many respects, as experience has proved. Gum is more hygroscopic than albumen; and plates that have been flowed with gum and then varnished are apt in time to crack all over the surface, more especially if they be exposed to fluctuations of temperature.

In conclusion: I wish to introduce to your notice a special form of spirit-level, which is particularly adapted for the purpose of levelling a camera; it is commercially known, I believe, as a "plumber's level." At the upper part of it a second much smaller level is accurately fixed at right angles to the ordinary one. Its use is to show not only when a thing is horizontal, but when it is vertical. Applied to the focussing-screen it shows at once whether the ground glass occupies a position at right angles with the horizon.

I wish also to mention that these large plates were all sensitised in a dipping-bath made of mahogany and lined with pure sheet india-rubber, as described in my former paper. The silver solution and the india-rubber remain mutually unaffected; and the lightness and inexpensiveness of baths so made render them deserving of more notice and wider adoption than they have yet obtained.

E. VILES.

## SOFT PRINTING.

Of all the ills which the young or inexperienced photographic printer is heir to there is none more annoying and vexatious than the above. I have frequently seen cases on which time and labour have been thrown away by the print—perhaps a large one—being completely wasted by this calamity. After filling one's frame and putting it to the light to find that it is completely destroyed by wrinkles! These are "wrinkles" we would rather have nothing to do with. As a cure for this I will inform my readers what ought to be done.

Let us suppose, then, that it is printing soft owing to the sensitive paper not being in some places in close contact with the plate. If it has not gone too far the fault may be remedied by doing this:—Unhinge one end of the frame, and gently, but firmly, keeping your finger on the print so as not to shift it; remove the back and backing, and hold the frame, with the paper towards it, to the fire for a few seconds, heating it slightly; then replace the back as before, and put out to print. If you examine it a few moments afterwards you will find that all trace of cockling has disappeared, and the print is thus saved from an untimely grave.

It was not my intention to give hints how to cure this malady, but instructions how to prevent the evil altogether. I have heard of many means made use of—such as turning the frame on its face before allowing to print, &c.—but they are of no good. What must be done is—first, see that your backing is perfectly smooth; a newspaper folded to the required size and a sheet of blotting-paper for placing next the negative is the best. The next thing to see after is the drying of the paper. This is a most important point, and is the chief cause of wrinkles, for two reasons: it may not be thoroughly dried—nothing is worse; or it may be put warm from the fire into the frame. I always dry my paper first thing in the morning, so that it may have plenty of time to cool and be in a fit condition for use.

I have been alluding to large plates, but the *carte* size also requires attention, as through neglect or carelessness the same thing might happen. The most suitable padding for them is cards (those without gold designs) which are surplus copies or of no use; but you must observe that they are not cracked or broken through the middle, else you will be certain to have cockling.

The paper should be dried in the morning, of course allowing it sufficient time to drip. Use nothing but perfectly flat padding and I am confident the photographer will not be troubled with soft printing either in 12 × 10's or *cartes*. Of course in some cases the frame is to blame, not being properly made or the back fitting badly; but, as a rule, damp paper is the principal cause of the printer's dilemma.

In a week or so I will give a little more advice on the management of this department. LINDSAY HOWIE.

## JOTTINGS FROM MY NOTE BOOK.

### No. III.—The Carbon Process.

I find an omission has been made on my part, and it is all the more curious as it relates to a circumstance I had most carefully noted, inasmuch as it is one of those things quite indispensable to modern carbon printing, and very probably one of those matters few trouble themselves about in reference to whom they are indebted for the boon. The separation of the operation of sensitising from that of making the tissue is not due either to Mr. Swan or Mr. C. K. Wyld, as might be gathered from my last. The first publication of this manifest improvement that I am aware of was made on July 15, 1863, by the late Mr. William Blair, he at that time saying:—"For this process [carbon] the paper could be manufactured and sold ready for the sensitising bath, and all the photographer would have to do would be to sensitise, expose, and wash."

My jottings are now resumed referring to the year 1868. Antonia Montagna, in an enlarging process, used collodion as a substratum on glass upon which to develope his carbon pictures. The use of collodion as a support for development is due to Fargier, he coating a plate with sensitised gelatine and then coating with collodion. The difference between Fargier and Montagna will now be readily seen, the collodion in Montagna's case being between the glass and the tissue. Mr. W. Firling, in May, 1868, used wax as a substratum on which to develope in order to facilitate subsequent transference. His method may be briefly stated as follows:—The exposed tissue was coated with a solution of wax in turpentine and attached with india-rubber to paper for development; after this operation came mounting to the final support, when the temporary one was readily removed by simply warming, which softened the wax and allowed the paper to be stripped off, leaving the print quite clean. This obviated the use of solvents for the india-rubber, and was most decidedly a step in advance.

In November, 1868, Mr. Adams developed carbon prints on metal plates and opal glass, both with and without waxing; of course such waxing was intended to aid subsequent transference. The works of this gentleman have given rise to a considerable amount of controversy; but any historian of the carbon process who would endeavour to administer justice impartially to the respective parties without taking into account the labours of Dr. Vogel—wherein he demonstrated that carbon prints could be developed without any adhesive material beyond such as exist in the tissue itself—must fail in his object. Following this M. Marion took out provisional protection for a single transfer process, such single transfers being obtained by the transference of the negative to a collodion pellicle, thus enabling the operator to expose his tissue in contact with the back of the negative. The tissue, after exposure, was transferred to albumenised paper, the albumen of which was subsequently coagulated by steam. Blair, at the close of 1868, described this means of transference for development:—Coagulated albumenised paper was brought in contact with the tissue *under water*, and before the tissue began to curl back the two were withdrawn and subjected to slight pressure; this was followed by development in the ordinary manner.

On February 3rd, 1869, Mr. J. R. Johnson took out a patent for certain improvements in carbon printing which he enumerated as follows:—First, an improved method of mixing the pigment with the gelatine. Second, a method of making tissue in continuous lengths, and the use of a film of wax to enable him to transfer the developed picture from its temporary support to the final one. Third, the substitution of resinous bodies in place of the albumen and gelatine, &c., hitherto used for transferring purposes. Fourth, the use of plates of metal or glass for developing purposes. This "improvement is based upon the observation that, if the support be impermeable to water and the tissue be well exposed, no cementing material is necessary to effect the adhesion necessary for mounting the tissue upon its support, all that is necessary being the perfect exclusion of air between the moistened surface of the tissue impressed by light and the impermeable surface to receive the picture as its support." What was claimed under this head is—"1. The formation of the mounting of the gelatine image formed as described upon a sheet of glass, metal, or other impermeable surface serving as the permanent support, without the intervention of any cementing material, to be used as pictures or as models, moulds for producing engraved plates, or otherwise. 2. The mode of transferring images of gelatine mounted upon the surface of plates of glass or metal from such surface (serving as a temporary support) to the surface of paper or the like material, by means of an intervening film of wax or other substance having the like properties." Fifth, and last, a mode of transferring a picture in one or many parts from the temporary to the final support.

Mr. David Duncan, in a communication to the *Philadelphia Photographer* about this time (beginning of 1869), described the following mode of transferring carbon prints:—A transfer paper was made with gelatine containing a white pigment, and used like ordinary transfer paper, contact being obtained with such pressure as could be obtained with a camel's-hair brush.

I suspect more than one transfer paper is made much after Mr. Duncan's method; but, as I am just now engaged upon an analysis of a variety of such paper, it is unwise to anticipate. I may have something to say on this matter at some future time.

Poor Duncan! No relative followed all that was mortal of him to his last resting-place. He died in a distant land, amongst strangers; still he is not forgotten—certainly not by those who claim the relationship of country to him. "After life's fitful fever he sleeps well." W. E. BATHO.

## FOREIGN NOTES AND NEWS.

A Threatened Revolution in Chromolithography.—New Photographic Appointment.—The "Gillotage" Process.—The Agenda Photographique.—New Method of Lowering the Density of Hard Negatives.—M. Husnik's Process of Phototypy.

For some time back a report has been current in lithographic circles of a new invention which is to completely revolutionise the

whole practice of chromolithographic printing. This report, we have it on the authority of the Hamburg *Lithographia*, is well-founded. A process has been discovered by which the inventor, whose name is not yet disclosed, asserts that a picture containing hundreds of shades of colour can be printed by a single pressure either upon paper, cardboard, linen, or tapestry. That sounds very enticing! But it is not all. The writer of the article in the *Lithographia* says that the inventor showed him several specimens of the results obtained by his process, and said that he was having presses of a peculiar construction specially made, but required no stone. He also proposes to arrange an international scale of colours and tints before publishing the details of his process. This scale is to be so arranged that, instead of ordering the colour of some part of a chromolithograph to be printed a light green, or a very light green, he will order it only from a numbered scale of almost infinitesimal gradations of every tint—as "Green Scale X., No. 923"—so that the desired tint may be much more exactly obtained than by any mere verbal description of the colour. The specimens shown were—first, a picture about twenty-eight inches high of a dancing harlequin, the colours of which were somewhat harsh, but gave quite the impression of being painted with the brush and intended for decorative purposes. There were two copies of this picture, both on linen. The second picture was a very delicately-tinted group of flowers upon tapestry, with a greenish background, all printed at once. The shadows of a single iris were especially beautiful, and it was easy to see that there could be no question of their having been printed in the usual way by plates passing one above the other. Then came a map, in which the depth of the ocean, in so far as it is known, was indicated by different shades of green, from deep green to almost white. There were also a number of other pictures on paper, some having the appearance of oleographs, but, unfortunately, the varnish on one of the latter had cracked and was partly peeled off. The inventor still shrouds his process in the thickest veil of secrecy, but we are promised that the veil will be removed, and that at an early date the details will be published, either in the columns of the *Lithographia* or in some other form.

Fraulein Emilie Bieber has been appointed photographer to Her Royal and Imperial Highness the Crown Princess of Germany.

The last number but one of the *Moniteur de la Photographie* gives a full-page impression of an engraving copied and reduced by the method known in France as "*gillotage*," the subject being M. Lobrichon's clever picture entitled *Le Bagage de Croquemstaine*, which was engraved for *Le Monde Illustré*. This process renders it possible to produce typographical plates for printing, in conjunction with letterpress, of reproductions of designs or pictures of any sort, and is admirably adapted to the purposes of book illustration. The plates permit of an almost unlimited number of proofs being "pulled," and possess this advantage, viz., that the exact spirit of the artist is secured without the intervention of a second hand in the shape of the wood engraver, besides being infinitely less costly than that mode of procedure. The original design, if prepared specially for this process, is usually made about one-third larger than the desired size; the consequence of the reduction is that the lines are finer, and a more perfect and finished picture is the result. It is applicable to the reproduction in typographic relief of lithographs, woodcuts, steel or copperplate engravings; indeed, to almost any form of picture. The scientific name given to the process by the inventor is "*pàniconographie*," and the specimen which is presented to the readers of the *Moniteur* speaks very highly indeed of its qualifications.

M. Leon Vidal announces the approaching issue, by the *Societé des Publications Periodiques*, of a sort of directory and almanac of photography combined, under the title of *Agenda Photographique*. This little work—which is intended to supplement, not replace, the *Annuaire*—will contain, in addition to numerous advertisements of use to photographers, a directory of the principal photographic houses in France, Belgium, and surrounding countries, and will be illustrated by several specimens of the most approved processes of photo-printing now known. The name of M. Vidal is a sufficient guarantee that the work will be brought out in a satisfactory manner.

The *Moniteur* also gives an account of a communication received from M. Letalle, of Birmingham, on the subject of permanganate of potash as a means of reducing the density of harsh negatives. The peculiar advantage of this method is said to rest in the fact that while the solution acts most energetically upon the denser portions of the negatives it leaves the half-tones in all their pristine beauty. The formula for this solution is two grammes of the permanganate in 1,000 cubic cents. of water, which is to be flowed over the plate for about a minute. After washing thoroughly the image is next treated with a solution of cyanide of potassium ten times as strong as the permanganate solution, and again washed; this may be repeated until the desired effect is attained. For negatives intensified by means of pyrogallic acid and silver it is necessary to increase the strength of the solutions two or three times.

The *Bulletin Belge* gives an account of M. Husnik's process of phototypy on glass, from which we extract the following particulars:—The support employed is a plate of glass about six millimetres in thickness, ground upon one side with fine emery. The grinding must be very carefully performed, as the slightest scratch or unevenness is sure to be reproduced in the picture. After a plate has been once used it requires to be reground before it can be employed again. The gelatine is removed by a strongly-alkaline solution of chalk and soda, and the surface reground in the same manner as before in order to remove the gelatine from the pores of the glass. The mixture with which the plates are first coated consists of—

| | |
|---|---|
| Pure albumen | 25 parts, |
| Distilled water | 45 „ |
| Silicate of soda of commerce | 8 „ |

mixed and beaten into a froth and left to subside. In six or eight hours it may be filtered. To coat the plates a large sheet of glass is accurately levelled, and one of the ground plates laid upon it. The above solution is then poured on and spread by means of a strip of paper, the surplus being returned to a separate vessel. The plate is then drained and reared against the wall to dry. When dry these plates will remain good for over six months, but should not be used on the day of their preparation. The sensitive coating is formed as follows:—

| | |
|---|---|
| Best French gelatine | 7½ parts. |
| Water | 150 „ |

After soaking for one hour the gelatine is dissolved by means of heat. One part of bichromate of ammonia and half a part of chloride of calcium are then added, and, when thoroughly dissolved, the mixture is completed by the addition of thirty parts of alcohol. This solution when filtered is poured upon the prepared plate and dried at a gentle heat. It is important to have the film of the right thickness, as if it be too thick it will not resist the scraper, while if too thin the grain of the glass shows through. After exposure the plate is printed in the lithographic press in the ordinary way, using two inks of different consistency and shades.

## FLOTSAM AND JETSAM.

The Exhibition of 1875 has come and gone, and there have been fewer grumblers than usual—a circumstance which, when found, is worth making a note of; and we seem to have been pretty unanimous in saying that it was the best display which the Society has yet had, although in what respect it owed its superior excellence it would, perhaps, be rather difficult to define. The portraits were not strikingly superior to former years, with two notable exceptions, while the paucity of landscape pictures was very noticeable; but what there were, somehow or other, seemed to possess a kind of fascination that made one linger over them, and go again and again to look at them, and feel reluctant to leave the room. Yet I do not think I could point to any as superlatively good, except, perhaps, one or two of Mr. Palmer's; neither do I recollect any thoroughly bad. It was, doubtless, the absence of this jarring element that made one feel that we had come "into the land where it seemed always afternoon." Taken altogether, I think we may lay it down that in the Exhibition of 1875 photography made a quiet, and at the same time almost unmistakeable, advance into the classical realms of art. Let us hope that there will be no retrogression. Mr. Faulkner's pictures helped, in a great measure, to show what photography *could* do. What a supremely happy man he ought to be! To have his pictures placed on a *par* with those of Sir Joshua himself, and that, too, in the *Art Journal*, was indeed a reward, but one which he richly deserved.

*Studies from Nature*, has, I see, now reached the fourth part, and is, I should think, by this time beginning to "feel its feet." Photographers should give this periodical their hearty support; the illustrations are, I believe, entirely from Mr. S. Thompson's own negatives, and, as a rule, are very good; but the interest in the work would be still further increased if contributions were invited from other artists. If proper care were exercised in the selection of subjects the work might be made to give an important impulse to photography from an artistic point of view. Thousands of negatives are at the present time stowed away in the plate-boxes of amateur

and professional photographers that would be of the greatest interest and value if brought to light. I have no doubt that photographers generally would be very willing to lend their negatives for the purpose, provided the artist received due recognition. It might then become to photographers what the *Art Journal* and the *Portfolio* are to painters, etchers, and others interested in art matters.

The makers of the various sensitive papers in the market would confer a still greater boon upon us if they would supply us with two kinds, namely, one sensitised on a strong bath, and another on a weak bath, giving the strength of the bath, and also stating whether both Saxe and Rive may be had. One maker, I think, does already act upon the latter suggestion. The utility of the ready-sensitised paper is at present somewhat curtailed by the neglect of the above points.

Can you, or any of your readers, enlighten me as to who is the inventor (?) of a certain wonderful process or processes by which a man is made an artist, and endowed with the manual dexterity appertaining to such gentlemen, *instanter* for a certain sum down? I had always imagined that this was only to be gained by long and arduous application for years. I am completely mystified. First M. Lambert (I presume a Frenchman) is the name connected with the above wonderful achievement. Next the advertisement informs me that "Mr. Lambert" (I presume an Englishman) is going on a tour through the chief cities and towns of the country to give photographers a chance of improving their art as well as, at the same time, enriching his pocket. And, finally (and this is what so exercises me), I am told (also by advertisement) that "Lambert" has perfected, &c., &c. We have, all of us, no doubt heard the remark—"Have you seen Simpson?" (I don't mean the respected editor of a contemporary, but some other man) and in return may I ask has anyone seen the "Lamberts"—that is, "M. Lambert," "Mr. Lambert," and "Lambert?" This latter style of signature I always thought was usually allowed to be the prerogative of noblemen; who then, may I ask, is this latest scion of our peerage who has thus deigned to honour our art with his attention? "Good wine needs no bush," and if the various processes of "Lambertype," "chromotype," and "contretype" are really what they profess to be—which I rather doubt, judging from the specimens lately on view in Pall Mall—they will make their way without any of the aid in questionable taste of which the various announcements respecting them at present savour.

Again: what is an "un-retouched enlargement"—a description appended to a portrait in the late Exhibition?

WRECKER.

## INTENSIFICATION WITH CHLORIDE OF PLATINUM.

THIS paper, read at the last meeting of the Vienna Photographic Society, is the joint production of Captain Victor Tôth and Herr Josef Maria Eder. The latter gentleman is a chemist. These gentlemen have been induced to undertake a series of experiments in order to investigate the claims that are from time to time put forward on behalf of various intensifiers, especially modifications of chloride of platinum; but their experiments with that metal do not seem to have produced any very satisfactory result. They, however, promise soon to give the details of a new method of intensifying, by which negatives of great density, excellently adapted to the production of engravings, may be obtained without the use of silver or platinum.

The admirers of platinum assert that it should be used in preference to gold or palladium, because it gives the pictures a beautiful tone, but they are not at one as to the kind of picture to which the mode of intensification is best adapted; for, on the one hand, the property of the chloride of platinum of preserving the half-tones, and the delicacy and softness of the negatives intensified with it, are extolled, while, on the other hand, it is recommended for the production of copies of line engravings, for which exactly opposite qualities are required.

The action of the chloride of platinum upon the silver bath being of a purely chemical nature intensification of platinum does not admit, like that with pyrogallic acid, of being indefinitely prolonged, but soon finds its limit; but, say our authors, it is not therefore to be under-valued when it is merely a question of perfect clearness in the lights, though on account of a tendency to fog it is not suited for reproducing engravings.

They first experimented upon the action of chloride of platinum upon a negative developed with iron, by comparing the results obtained with solutions acidified with various acids and of various degrees of concentration. Some persons use a solution neutralised with soda and acidified with nitric acid; others use a solution acidified with acetic acid; and others, again, neutral solutions. Opinion is also as variable with regard to the proper concentration, which, according to some, is 1:120, and varies even to 1:7000. The proportions adopted in this case were as follow:—One part of dry chloride of platinum was dissolved in 800 parts of distilled water; half-a-litre of this solution was acidified with twenty drops of chemically-pure nitric acid; a second half-litre was acidified with thirty drops of glacial acetic acid; and a third with twenty drops of muriatic acid. The action of the different solutions was compared by a fragment of the same negative being placed in each of the three porcelain cups containing the solutions, and their being left there for the same length of time. The action of the three baths was pretty much alike; the silver bath soon became of a deep black. The solution containing nitric acid worked, if anything, quicker than the others, and that acidified with acetic acid slower; but after the first minute there was really no visible difference, and the plate, even in the acetic acid solution, was quite as dense as the others. After the fragments stood half-an-hour the densifying action ceased, and the same thing was observed in the case of other plates which were left fifteen hours in the bath. The fragments were then washed and dried, and on being examined by transmitted light it was found that, though very dense, their intensity was the same, and did not greatly exceed that of the unintensified part of the negative.

The result of comparative experiments with two solutions—one of 1:200, the other of 1:200, showed, as was to be expected, that the more concentrated worked quickest and finished the intensification soonest; but with time the more diluted arrived at the same result. The concentration which recommended itself to the experimentalists was from 1:800 to 1:1000.

Grüne mentions, somewhere, that the silver picture is changed into chloride of silver, without depositing a single trace of platinum, if the solution contain an excess of muriatic acid, and is then further acidified with nitric acid. This expression of Grüne's opinion was the next subject tested.

Twenty drops of nitric acid were added to a solution of platinum acidified with muriatic acid, and a fragment of a negative was put into it; another piece was put into a solution simply acidified with nitric acid; and a third was left unintensified. The platinum was immediately thrown down in the bath containing muriatic and nitric acid, and in half-an-hour both plates were taken out of the baths. That intensified in the first bath looked bluer and thinner than that in the second, but it evidently contained a good deal of platinum. On considering that in the most impure solid chloride of platinum there never appears even half so much muriatic acid as they purposely added, and yet obtained a pretty platinum picture, they feel justified in concluding that Grüne is mistaken, and that to expel the last remnant of free acid by heating for a long time upon a water bath the previous neutralisation with soda is superfluous.

Neutral solutions of platinum showed no advantages; they only work more slowly than the acidified. The employment of platinic sal ammoniac, which was also proposed on account of its neutral reaction and resistance of the atmospheric action, was found to have no advantages over chloride of platinum, being both dearer and more difficult to obtain than the latter. They gave the preference to a solution of one part of chloride of platinum in 1,000 parts of water and twenty drops of nitric acid. By the action of the chloride of platinum upon the picture the silver in the latter is converted into chloride of silver. The negative, therefore, becomes darker through the re-solution of the chloride of silver, and some photographers were thereby induced to disolve out the chloride of silver—a conclusion which is quite opposed to the purpose of intensification.

Herren Tôth and Eder recommended in this case that the chloride of silver be converted into metallic silver, by which means the silver in the picture is retained and immediately reaches a fixed degree of density. They, therefore, coat the picture after the intensification with chloride of platinum without washing it with an iron developer, so that the chloride of silver is reduced to silver. The density can be still further increased if, after washing the developer well off the plate, the latter be put a second time into the platinum bath, when the same quantity of platinum will be thrown down as the first time, and there will remain in the picture exactly as much metallic silver as it contained at the commencement of the intensification. By thus repeating the development and platinising the negative becomes denser; but it does not allow of its being brought to any desired degree of opacity, because, by the time the operation has been repeated three or four times, the black platinum thrown down no longer lies solidly together but floats.

They also experimented with an addition of sulphate of iron, with which the process of reduction and precipitation is performed in the bath itself. They dissolved twenty grains of sulphate of iron in half-a-litre of platinic solution acidified with acetic acid; the result was the same as with the separate use of the developer and the pure solution of platinum, but the pictures were denser than when simply platinised once with chloride of platinum. Unfortunately in a few weeks a solution of platinum containing sulphate of iron resolves by the separation of the platinum in a metallic form. They do not, therefore, recommend this addition to the platinum bath. They also lay stress upon the idea that this method of intensifying is much more suited to portrait negatives than the reproductions of engravings; and that for the latter purpose chloride of platinum is only suitable when used in a different way.

For this latter purpose there are many ways proposed for the subsequent intensification of a negative weakly intensified with silver, either with platinum or by combining gold or platinum with mercury. They endeavoured to eliminate the silver completely, for the reasons already mentioned; but they did not think of trying either the uranium or the mercuric intensifiers, because their well-known drawbacks outweighed the advantages.

Sulphate of ammonia and Schlippe's salts gave good results. The way in which they were used was simple. They intensified, as before, with platinum, reduced the chloride of silver formed with sulphate of iron, and repeated the process twice or thrice. After the last treatment with chloride of platinum the plate was *not* again coated with the iron solution, but the chloride of silver was allowed to remain as such if it were intended to intensify subsequently with sulphate of ammonia or Schlippe's salts. The sulphate of ammonia is poured over the plate after it has been carefully washed, and the intensity of the blacks is increased. In this way the details do not suffer in the least.

At the end of all their experiments they felt quite convinced that the advantages of intensifying with chloride of platinum are, on the whole, quite counterbalanced by its faults, and that this process will never come into general use.

## "THE LADIES OF THE PROFESSION."—SKETCHES.

### Sketch No. 2.

The next incident I remember was of an entirely different class. I was in the West of England, and the time was autumn. All nature glowed with the golden beauty of departing summer. It had been a very hot season, and the earth was pouring upwards shimmering cataracts of heat; the distance was indistinct, and the nearer portions of the landscape looked quivering and unsubstantial, seen through the heated air, as I neared the village where my lot had been cast for a week or two, tired with a long walk and laden with my knapsack apparatus for views.

I was stopped by the appeal—"Please, give me a penny." I looked down on a wee bit of humanity in the shape of a little girl, poorly but cleanly clad, wearing a sad, pinched look on an otherwise pleasant face. "Please do," the child continued, "mammy's so bad." I had not the heart to refuse, and the trifle made her soft brown eyes sparkle with delight as she ran off in another direction to that I was going. I reached my inn, and it is marvellous what a good dinner will do towards softening the asperities of human nature. As I sat afterwards, luxuriantly puffing my cigar, thoughts of the little one who had stopped me for coppers would come across my mind. I wondered who she was, and what was the matter. The longer I mused the more I felt I should like to know all about her. I ended by summoning the waiter, whom I had noticed at a little distance during the interview, to ask him to enlighten me. "Who is she—that kid? Why her name it be Parfitt. Her father be a potographer. There has been summat up at the house—bailiffs or summat, I ben't rightly sure. Anyway, they aren't much account. If you want to go to the house you can find it by the pictures at the door." There was another man, Sam went on to tell me, that did likenesses fine, of the name of Brown, much better than Parfitt. "Me and my young woman has been took so natural you can see the very pattern of her hankercher."

As I had obtained the information I wanted I dismissed the loquacious Sam, fully making up my mind to pay Parfitt a visit in the morning, which turned out bright and sunny—one of those lovely autumn days that makes staying indoors seem a sin. Without much trouble I found the house. A small case of glass positives hung at the door, much damaged by exposure, and the place generally looked "seedy." I rapped, and the child before mentioned opened the door, looking as if all the cares of the world hung on her shoulders. She put her finger to her lips and said—"Hush! mammy's asleep!" I inquired for her father, who, she told me, had gone up the street, but she would fetch him in a minute. During her absence I made a general survey. Everything seemed of the poorest description; in fact, there was little save bare necessaries and hardly that. The proprietor presently came in leading his little girl by the hand. He looked a consumptive man of about forty years of age and seemed very nervous. I told him I was a photographer and had called for a chat. This seemed to set him more at ease. He had evidently taken me for someone with less amicable intentions. In the course of our conversation he told me the following:—

He had just been to pawn his lens for half-a-crown. They would not give him more on such things there, and when that was gone he did not know what he should do—starve, he thought. If it were not for his wife and child he would drown himself and so end his misery. Little by little all his goods and chattels had found their way to the same place, and now they were in a positive state of destitution. His wife was in a consumption accelerated by privation, and he did not think she could live long unless she had more comforts; they did not like applying to the workhouse if they could in any way help it. When she was about things went on better. He supposed he was not a business man, and had only six months before come from Exeter and started in this line; they were strangers here to almost everybody. When they first began things promised well; but another photographer had set up in opposition, and, as he was a pushing man, he took the little trade they had. What he was to do, without money and without friends, he could not tell; he was ill himself. He should not care about that so much if he could get enough to keep Mary and his little one; in fact, he was in as low, despondent a state as he well could be.

Here a short, hard cough was heard, which seemed to startle him into something like energy. He must give his wife something to take, her cough was so troublesome and distressing. He returned after a few minutes and asked me if I would mind seeing his wife. I followed him, and there upon the ground, in a corner of the room, on a bed of straw, and covered with some old bits of carpet and an old coat, lay the wreck of what had once been a decidedly pretty and engaging woman, apparently about thirty years old. The little girl sat on the ground beside her, with such a look of patient misery on her pale face that I felt, to say the least of it, uncomfortable. In a weak voice the mother apologised for not having a chair to offer me; and, taking me for a doctor, asked if I could give anything to her husband to do him good? No thought for herself in all her trouble. Her husband and her child had all her love. When she was able to get about she could get a little by sewing. Now she felt so tired and her eyes were so dizzy that an income from that source was out of the question. The last work she had done had not given satisfaction, and she only was paid half-price. She supposed she was not used to it, and other people could do it better. The exertion of talking, however, brought on another fit of coughing; so I took my leave, promising to look in again the following day, leaving them, at anyrate, in better spirits than I found them.

I was never destined to see her again. Death's cold grip had fastened on her, for that same night, with her husband at her side and her child fondly pressed to her, she passed away. I obtained help for the father and child, and the last time I saw them they were far removed from poverty; but the former sad passage in his life had left him a quiet, sad man, only roused by the cheerful companionship of his daughter, now grown up into a comely, helpful, and amiable girl. In quiet moments that studio scene often occurs to my mind, and I earnestly hope such are "few and far between." E. D.

# Our Editorial Table.

### Readings for Lantern Exhibitions.—Illustrated Guide for Painting Magic Lantern Slides.

London: T. J. Middleton.

In addition to the two works above named we have also received from Mr. Middleton his *Catalogue* of dissolving-view apparatus and slides, which has attained the dimensions of eighty-six pages. In this catalogue we find not only the prices of lanterns and apparatus, but most copious lists of pictures arranged in series, such as *Tour up the Rhine*, *American Scenery*, *Scotch Views*, *Palestine and Syria*, *Ireland and its Scenery*, and soforth. The mere mention of such subjects suggests how closely allied photography has become to the magic lantern. In the *Guide for Painting Lantern Slides*—which is copiously illustrated—the instructions in this fascinating art are given with singular plainness and with a degree of discrimination indicating that the author possesses an intimate practical acquaintance with the subject on which he writes. The *Readings* are very concise and comprehensive, the respective subjects being arranged as lecturettes, in which the various authors have managed to compress much valuable information into a small compass.

### Studies from Nature. By Stephen Thompson.

London: Sampson Low, Marston and Co.

In this, "Part IV.," of Mr. Thompson's *Studies from Nature*, we have four pictures, accompanied by appropriate letterpress descriptive matter peculiar to each. Two of these views represent scenes suggestive of pleasant thoughts, being dashing mountain torrents. One of these—*Cascades near Stonethwaite, Borrowdale*—is as pleasantly-wild a bit of nature as the most ardent lover of the picturesque could desire. *Hop Picking in Kent* shows with excellent effect one of the most important of the field industries of the south of England.

### Cathedrals and Abbeys. By E. Wormald, Leeds.

When we gave an account of our visit to Bradford, on the occasion of the meeting of the British Association in that town in 1873, we spoke of the ruined abbeys for which Yorkshire was so famous. Two of these—Kirkstall and Fountains—we are enabled to revisit and minutely inspect through the artistic results of the prolific and potent camera of Mr. Wormald, who is so well known in connection with the production of photographs of the largest dimensions usually taken. The singular

perfection of these pictures, as well as those of the cathedrals of Salisbury, Exeter, and York, more than realise the hope we expressed in 1873, that more effective pictures of these famous abbeys might yet be taken than any which could then be purchased in the neighbouring towns; for views either better selected or more worthily executed than those of Mr. Wormald it were difficult to imagine.

Permanent Silver Prints. By W. M. Ayres.

Mr. Ayres has sent us three photographs which were printed by him in silver nearly twelve years ago. The special point in connection with them is the gratifying one that, although they have been freely exposed to air and light, they show no indication whatever of fading. We are not surprised at this, for we are very well aware of the skill and care bestowed by Mr. Ayres on his printing operations.

Pictorial Backgrounds. By J. Werge.

The *brochure* before us is a new edition of one we have previously noticed. It contains a large proportion of new matter devoted to a description of a method of producing opalotypes with ivory black. The instructions for producing this attractive kind of portrait are very clearly given.

Christmas and Other *Carte* Mounts. By William Wright.

Mr. Wright, Wine Office-court, Fleet-street, favours us with samples of *carte* portrait mounts, one of them being of a highly ornate character specially adapted as a Christmas card on which to mount a medallion photograph. The printing and designs are of a high class.

Centennial Views, Showing the Progress of the Exhibition Buildings, Philadelphia.

Through the kindness of Mr. L. T. Young we have received from Mr. A. H. Hemple a series of stereoscopic views showing the progress of the buildings in which the first great American Exhibition is to be held. These prints give a most excellent idea of the capaciousness of these immense erections. The stereographs are beautifully executed.

Letts's Diaries.

London: Letts, Son and Co.

On a former occasion we directed attention to the immense variety of the items of useful information given in these admirable diaries. That this feature is increasing may be gathered from the fact that in one of them, "No. 10," there are no fewer than 136 pages devoted to this department. In particular, we find a most admirably-compiled colonial and country banking directory—a feature of great commercial utility—together with other useful features.

# Meetings of Societies.

## EDINBURGH PHOTOGRAPHIC SOCIETY.

This Society held its first "popular meeting" of the season in Queen-street Hall, on the evening of Wednesday, the 15th inst. The exhibition consisted of a miscellaneous series of transparencies by members of the Society, and a descriptive lecture by Dr. John Nicol.

The lecturer, who appeared on the platform at seven minutes past the appointed hour, began by saying that he sympathised to a certain extent with the impatience of the audience which had been manifested during the last five minutes; he, however, thought he was entitled to a measure of sympathy in return. They would easily understand that it was extremely unpleasant, after the exhibition had begun, to be interrupted by those who were in the habit of coming in late, and that he had waited for seven minutes simply to give them an opportunity of taking their places. He assured them that in future, if they would make a point of being in their seats by eight o'clock, he would commence punctually at that hour.

Dr. Nicol then stated that the exhibition about to commence was in some respects different from that which generally formed the subject of the popular evenings, in so far as there was on this occasion no connected series of pictures, and, consequently, no connected story to tell. The committee had thought it advisable to give the members an opportunity of exhibiting their pictures, and for that purpose had invited those who had transparencies to send them in to him. Only seven, however, had responded to the invitation; but what was lacking in the number of exhibitors had been fully made up by the number of pictures the seven had sent, and, although the collection was necessarily of a miscellaneous character, he had no doubt the exhibition would prove satisfactory.

The hall was then darkened, and a series of very fine portraits of children, singly and in groups—some with finely-managed floral borders, and also a few of the "city arabs" in all their wretchedness, and of the same practising various trades after they had been trained in the ragged school—the work of Messrs. Ross and Pringle, were shown on the screen. These were followed by a number of well-chosen pictures of several abbeys, &c., in Dumfriesshire, photographed by Mr. Murray Gartshore, of Ravelston. These were succeeded by a series of horse and cattle pictures, by Mr. Foster, of Coldstream, who (the lecturer said) fairly divided the honours with Mr. Ross in having attained the highest possible degree of excellence in two such difficult, though very different, branches of the photographic art. The pictures, of which there were a large number, were arranged, so as to give an idea of the nature and succession of the work on a farm, and their exhibition received much well-merited applause. From the works of Mr. Foster the lecturer passed to those of Mr. Mathison, who (said the lecturer) afforded another illustration of the frequently-quoted observation, that "the busiest man has most leisure." Mr. Mathison, he said, although at the head of a rather exacting business, nevertheless found time not only to snatch an occasional hour to photograph, as would be seen, some of the ancient picturesque parts of the city that were fast being replaced by more modern structures, but also to go, camera in hand, to almost all parts of the country and bring back pleasant memorials in the shape of excellent photographs. The collection included fine "bits" of both the old and new town, rustic cottages, and quaint corners in Currie, Spylaw, &c., &c., and architectural views in Peeblesshire, including the houses of Forbes Mackenzie, at Portmore, and Mr. Tennant, of the Glen. Dr. Nicol then introduced a number of his own pictures, principally views in and about Yetholm, the capital and head-quarters of the gipsies. He said that, in common with most people, he had long had a wish to visit Yetholm, but until this season had not had an opportunity of doing so. After describing the journey from Kelso to Yetholm, and the comfort of the inn kept by Mrs. M'Callum, he showed a number of pictures illustrating the appearance of the village and the kind of houses which the tribe occupies, finishing with the royal palace and a portrait of Queen Esther herself. The lecturer here gave a humourous description of his interview with the queen, whom he described as a hale, hearty woman of eighty-two, who would drink nothing stronger than tea, but had no objection to join him in a smoke, as did also the "Princess Royal" who happened to be on a visit to Yetholm at the time. He described the "crown jewels," consisting of a large number of rings, some of them of considerable value, which had been in most cases taken off the fingers of distinguished visitors and presented to her; and also the "state papers," which are a series of letters written to the queen by a considerable number of earls, lords, ladies, and a host of people of lesser importance. The portrait of the queen, and also several views of Kelso, were the work of Mr. Macintosh, photographer, of that town, and were of excellent quality. The exhibition concluded with a number of recent pictures by Mr. Wilson, of Aberdeen, consisting mainly of instantaneous views on highland lochs and the Thames.

The audience was, as usual, very large, and the exhibition highly successful, both pictures and description, especially where interspersed with appropriate anecdotes, eliciting considerable applause.

## VIENNA PHOTOGRAPHIC SOCIETY.

There was little or no business of general interest transacted at the last meeting of this Society with the exception of the reading of a paper upon the *Intensification with Chloride of Platinum.* [See page 620.]

The Committee appointed to award the Voigtlander prize reported that there were five competitors.

The President reported as to the steps that are being taken for the regulation of the sale of poisonous drugs and chemicals. He showed a number of collotypes and photographs sent by M. A. de Blochouse, Vice-President of the Belgian Photographic Society; and also a number of heliographic reproductions by M. Scamoni, of St. Petersburg, of pictures by Professor Laufberger, of Vienna, and others.

The question—"What are the disadvantages, besides the danger of fire, of the habit of smoking in the studio?" was drawn from the question-box, and discussed at length; after which the question—"What is the cause of the raindrop or wormy-looking spots in the varnish of plates when they are kept in a dry place, and how can such negatives be best repaired?" was asked.

Herr Riewel said he had repeatedly observed these worm-shaped elevations, and attributed them to defective drying before the application of the varnish.

Herr Gertinger was of opinion that the fault was caused by the great amount of water in the collodion and the remains of some chemical left by insufficient washing.

Dr. Szekely had observed it in negatives which had been printed for some time in a damp atmosphere.

Herr Luckhardt recommended, as a preventive measure, that the negatives be kept in a dry place and rolled in white blotting-paper.

There were no new suggestions for renewing the varnish; but hints on that subject have already been given over and over again.

A tourist's photographic apparatus, by Herr Oscar Kramer, of Gasc and Charconnet's, of Paris, was exhibited, as well as a large number of carbon prints, &c.

Herr Luckhardt spoke of making arrangements with Mr. J. R. Sawyer, of the firm of Spencer, Sawyer, Bird and Co., London, to visit Vienna after his visit to Berlin, in order to demonstrate practically the carbon process as worked by his firm; but nothing was definitely decided before the close of the meeting.

# Correspondence.

## EMULSION DIFFICULTIES.

*To the* Editors.

Gentlemen,—Knowing that you take a deep interest in emulsion work I shall be greatly obliged if you can give me any information which will help me out of the following difficulty:—

In July last I started to prepare an emulsion as described by Mr. Edmund Phipps in the volume of the Journal for 1874, page 532. I succeeded very satisfactorily up to the time of dissolving the pellicle. I got a beautiful emulsion, and, after pouring out into a dish to set, I washed it, and after adding the necessary parts of alcohol and ether to dissolve the pellicle my troubles began. Instead of forming an emulsion I have a precipitate, the solution alone being as clear as water; but when I shake it up it seems like any ordinary emulsion—perhaps it may be a little more fluid. If I coat a plate with it, it leaves the glass with a clear, granular deposit.

If you can explain the cause of the above I shall esteem it a great favour.—I am, yours, &c., Washed Emulsion.

*Manchester, December* 20, 1875.

[A similar result to that described by our correspondent is frequently met with in using a *very* unsuitable pyroxyline. It is, however, quite possible to produce it in its most aggravated form by carelessness or inattention to the instructions given. For instance: no mention is made in the above letter of the pellicle having been dried after washing. This in itself would, in many cases, prove quite sufficient, according to the quantity of moisture retained in the undried mass. Another probable cause is washing the pellicle before it has properly set.—Eds.]

## PRINTING IN FATTY INKS.

*To the* Editors.

Gentlemen,—I notice in your last week's number a paragraph in which it is stated that M. Despaquis claims as a novelty the supplementary exposure to light of the back of the gelatine film after it has been printed under the negative. Will you allow me to point out that the method in question, which is technically known as "sunning," has been in constant use in this country ever since the introduction of the collographic printing process.

I know nothing whatever of M. Despaquis' process, which may be new in other respects, nor do I wish to discuss the question whether any advantage is gained by the "sunning;" my only object is to show that what is now claimed as a novelty has been well known for years to those who are at all conversant with the subject.—I am, yours, &c.,

*December* 21, 1875. G. P. D.

[The method of exposing from behind was alluded to as having had a prior existence when, last summer, we gave the details of M. Despaquis' process.—Eds.]

## THE LIME LIGHT IN THE THEATRE.

*To the* Editors.

Gentlemen,—Perhaps Dr. Nicol is not quite right in supposing "there is not much connection" between the stage and photography, for, most photographers may learn something from a visit to the "property room" of a really first-class theatre, particularly those gentlemen who deal much in natural foregrounds, boats, &c. A skilful "property" maker will manufacture for the photographer elegant vases, caskets, tripods, pilasters, &c., in compo. or *papier maché*, at a very small cost; and, as to rustic porches, windows, gates, and stiles, why he is quite at home amongst them. So far there is a *slight* "connection"—more, I think, than can be found in the *lime light.*

The majority of photo-enlargers would gain little from an inspection of so large an apparatus as the one described by Dr. Nicol. I say this from experience, having enlarged for the profession for some years (solely by the lime light), also having made and had under my management two of the largest theatrical lime-light apparatus in the kingdom. At one of these theatres (the Prince's, Manchester) forty lights can be kept burning at once. I know of no theatre in London that can do this, with their present "fit up."

The gas-holders used at the Prince's are similar to those described by your contributor, and he is quite right in supposing they must not be allowed to get anything like empty when a number of lights are being supplied from them—the force becoming so very weak.

The condenser in each lantern is a plano-convex of very short focus, and not "cast," but of the best class. Coloured glasses cannot safely be used when the light is immediately above the head of the person to be illuminated, the heat of the light frequently breaking it and causing danger to the performer below. Coloured talc on light wooden frames is used for these cases. It is impossible to control the lime lights from the "prompt" corner by levers "arranged beside those controlling the illuminating gas." A man must remain beside each light whilst burning, unless two or more are sufficiently near for him to manage them.

Dr. Nicol says that Mr. Truefit, the scenic artist at the new theatre, intends to "produce a transparency which, by the aid of the lantern, will be projected on the canvas, and then the sketching will be a simple matter"—simple, in fact, as that other "branch of art," the schoolboy's transparent drawing-slate. I *think* not. In the first place, the "drop cloths" are, as Mr. Truefit knows, sometimes over thirty feet high, and are placed upon a suspended frame that, by a mechanical arrangement, will sink through the floor to enable the artist to work on the top of the picture without mounting a ladder. With the lantern arrangement I presume all the picture would have to be "projected on the canvas" at once, and from its great size would be but dimly shown, however good the light. If it were an architectural subject that was being produced I am under the impression that the drawing would have to be completely gone over again to correct mistakes, crooked lines, &c., caused by the painter balancing himself, charcoal in hand, on the top of a tall ladder, and in semi-darkness. Besides, special paint-rooms would have to be erected, or the canvas placed at the back of the stage, and the lantern in the dress-circle.

In conclusion: Dr. Nicol need not doubt that "the *average* scene-painter will take kindly to the innovation." *He* most likely will use it; the genuine scenic-artist never will.—I am, yours, &c.,

*Manchester, December* 21, 1875. Prompter.

# Miscellanea.

Annual Dinner of the South London Photographic Society.—The members of the South London Photographic Society held their annual dinner at Anderton's Hotel, on Saturday last, about forty gentlemen being present. The Rev. F. F. Statham, M.A., F.G.S., President, occupied the chair. After the enjoyment of a good and substantial repast, the toasts usual on such occasions were proposed and duly responded to. Songs and recitations also conduced to render the evening pleasant and harmonious.

Another New Antiseptic.—Among the benzole group, all of which are derived from coal-tar, are (besides the phenol or carbolic acid ($C_6H_6O$) and its many compounds) the cresol ($C_7H_8O$), the phlorol ($C_8H_{10}O_2$), and the phynol. The latter, of which the composition is $C_{10}H_{14}O$, is also found in the volatile oil of thyme, together with thymene ($C_{10}H_{16}$) and cymene ($C_{10}H_{14}$); but the cheapest source of its production is coal tar. Several compounds of the phynol were studied by chemists long ago; but it was reserved for Lewin, of Berlin, to discover that it is a powerful antiseptic. When pure it consists of transparent crystals of a very agreeable and strongly aromatic odour: while it is so powerful that a single grain in thirteen ounces of hot water is a sufficiently strong mixture for all purposes. Comparative experiments have shown that it possesses a much greater power to arrest fermentation and putrefaction than either carbolic or salicylic acid. Added to a solution of sugar with yeast it arrested fermentation; added to milk it arrested coagulation till twenty days later than is usual, and after forty days there was no vegetation visible. Albumen of eggs did not show putrefaction at the end of eleven weeks, and the peculiar aromatic smell was still prevalent at that time. Even in bony substances, otherwise so ready to start decomposition and putrefaction, it was able to arrest all putrefactive change for not less than thirty-five days. It thus appears that the benzole series contains the best disinfectants, and that carbolic acid, which has hitherto enjoyed the highest reputation, is by no means the best in the series, and that it will be superseded by the fragrant thymol, until perhaps some better antiseptic is discovered.—*Scientific American.*

## LONDON GAZETTE, *Friday, December* 17, 1875.

Bankrupt.

Cuthbert, William, Scarborough, albumenised paper manufacturer. December 31, Scarborough.

*Tuesday, December* 21.

Bankrupt.

Starling, Josiah Pring, Brunswick-place, Blackheath, photographer. January 4, 1876, Greenwich.

## ANSWERS TO CORRESPONDENTS.

PHOTOGRAPHS REGISTERED—

J. Forrest, Clitheroe.—*Three Portraits of the late Henry Hall.*

T. Ralph, Dersingham.—*Group of the Princesses Louise, Maude, and Victoria.*

☞ *Correspondents should never write on both sides of the paper.*

R. J. P.—You will have seen that the subject is finally settled, and have also ascertained our opinion on the matter.

DR. R.—We have not heard from, or of, the gentleman named since 1865. It is probable that he died about that time.

SIGMA.—Thanks for your remarks. The subject is one that possesses much interest, especially to those who are acquainted with the early history of photography.

J. C.—There is no discrepancy whatever in the reports; each reporter presents so much of the conversation as he consider necessary to enable the reader to understand the matter.

W. G. A.—Try the effect of using a forty-grain solution of iron with a little citric acid in it; but you must be sparing in your use of the acid, as it is a very powerful restrainer.

DON CÆSAR.—We regret our inability to answer your query this week. We have placed the matter in the hands of a gentleman holding an official position, and hope to receive his reply in the course of a few days.

NORTHERN STAR.—The Kinnear camera is a light and effective instrument, and is a form that is well adapted for using with a single lens; but a camera having a square bellows body will be requisite if you desire to obtain stereoscopic pictures in addition to single views.

S. B. J.—The appearance of the image as described by you indicates a lens in which the glasses have not been properly put together. If it be of foreign manufacture we can imagine that the position of the back lenses has been reversed, as they are frequently placed loosely in the cell.

E. F. R.—The Photographers' Benevolent Association *is* still in existence, and, judging from a report which appeared in our last issue, it seems to have before it an active and useful career. The greatest confidence may be placed in the business skill, honour, and integrity of its executive.

PAX HOMO.—If the dealer be a respectable man he will have sent you the article you ordered. We are not, however, sufficiently well acquainted with the lens described by you to give, from your description, an opinion as to its genuineness. This we could only do after an examination of the instrument.

B. MORGAN.—The offensive smell of the albumenised paper is owing to its having been prepared with old or decomposed albumen. We have, however, known paper acquire this smell by being kept in a damp place, by which the albumen became decomposed to an extent sufficient to emit an offensive odour.

GEORGE TARN WILLIAMS.—Strictly speaking it is illegal to make a single copy of a copyright engraving even for your own gratification and without any intention of selling it or even of giving it away; but if your "piracy" have been confined to this extent and purpose nothing will be said by the publisher.

ROSCIUS.—We now know the cause of your non-success in obtaining a solution of the india-rubber. The bisulphide of carbon is excellent, but the rubber is of a black, semi-vulcanised description, against the use of which we have frequently warned our readers That your solvent is quite good we proved in a satisfactory manner by placing in it a few shreds of white rubber, which dissolved rapidly.

H. W. E.—Several years ago Mr. Cramb, of Glasgow, took a number of views in the Holy Land. They were published, but we are not aware by whom. A note addressed to the gentleman named would, doubtless, elicit the information. There are other photographs of Palestine scenery beside those by Mr. Cramb, information respecting which might, perhaps, be obtained on application to a dealer in photographs.

GEO. CLARK.—The photolithograph is most excellent. We have certainly had in you an apt pupil. The enclosure marked "No. 3" has the appearance of having been printed from a reproduced negative. The reproduction of negatives having now been carried to a high state of perfection, it is very difficult to speak with any degree of certainty concerning the fact of any proof having been printed from an original or a reproduction.

INQUIRER.—The proportions and materials employed by the late Mr. Burgess for making his eburneum pictures were—

| | |
|---|---|
| Gelatine | 5 ounces. |
| Water | 20 ,, |
| Glycerine | ½ ounce. |
| Oxide of zinc | 1 ,, |

F. M.—There are two methods by which brass may be blackened—one by the application of a dead black varnish composed of lacquer and a black pigment, the other by staining the surface. This will best suit your purpose. It is effected by making the brass very clean and then brushing it over with a solution of bichloride of platinum, which, when used for this purpose, is designated "chemical bronze." The addition of a drop or two of solution of nitrate of silver to an ounce of this bronze is said to improve its efficiency.

FRENCH PATENTS.—Several English readers having applied to Professor Stebbing, our Paris correspondent, for copies of a certain French patent, we are requested by that gentleman to state that such copies must be obtained through a patent solicitor, who is obliged to write to the government for permission. The fee to the government for permission, added to that of the solicitors, will amount in all to about 100 francs, or £4. Among the various solicitors through whom application may be made may be mentioned the name of M. Mennons, 52, Rue Basse du Rempert, Paris.

MR. HANSON'S DEVELOPING FORMULA.—Colonel Wortley writes to say that he will certainly try the formula recommended by Mr. Hanson. He adds:—"As he seems to like the acetate of iron, will he try the formula by which I took my first instantaneous pictures, and which formula I published in 1863? It contains acetate, and formic acid instead of acetic, and is a particularly good one. I always have a bottle of it by me, and it is so reliable that I use it as a standard developer against which to test others."——On referring to our volume for 1863 we find the formula for the developer mentioned by Colonel Wortley to be as follows:—

| | |
|---|---|
| Sulphate of iron | 20 ounces. |
| Distilled water | 120 ,, |

Dissolve.

| | |
|---|---|
| Acetate of lead | ½ ounce. |
| Water | 5 ounces. |

Dissolve.

Mix the above solutions, and when the precipitate has all settled decant off very carefully. Add—

| | |
|---|---|
| Formic acid | 5 ounces. |
| Acetic ether | 1½ ounce. |
| Nitric ether | 1½ ,, |

This is kept as a stock solution, as much as is required for use at a time being filtered off, and acetic acid added in proportion, according to the temperature of the weather and the class of picture required. Colonel Wortley takes exception to our "append" to his last letter, and says that he *has* published very minutely; but we think it undesirable that the subject should be reopened.

LIONEL.—Our correspondent writes:—"I have been a careful reader of your Journal in respect of the various emulsion processes, but I have not seen that any endeavour has been made to get rid of the product of the sensitising salts other than the bromide of silver. In the gelatino-bromide process this is done by dialysis, as pointed out by Mr. King and others. In Canon Beechey's process, recently given in your pages, the collodion is sensitised with bromide of cadmium and nitrate of silver. This will produce, by double decomposition, bromide of silver and nitrate of cadmium. This latter salt, according to the late Mr. Sutton, if present in the nitrate bath, greatly reduces the sensitiveness of the plates. If this be so, will it not also affect materially that of the collodio-bromide plates, where it is present in a more concentrated form? I shall be glad to hear your remarks on this subject. Your personal experiments described in the Journal are very interesting to those of your readers who have not the time for experiment."——"Lionel" appears not to realise the fact that what he desiderates has been supplied in the emulsion process of Mr. W. B. Bolton. At one stage of the preparation of what we may term the "Bolton pellicle," it is subjected to a washing in water *for the purpose of removing the soluble salts.* In our ALMANAC for 1875, at page 55, in the course of an article devoted to this process, it is specially insisted upon that "all soluble matter must be removed before drying the pellicle." But, if "Lionel" has in his mind's eye the removal of the soluble salts without having to be at the trouble of converting the collodion into a pellicle, we are happy in being able to inform him that we have at present an article in type which will appear in our forthcoming ALMANAC, in which the method of dialysis is applied to collodion emulsion as well as to that of gelatine.

**☞ Editorial Communications should be addressed to "THE EDITORS"—Advertisements and Business Letters to "THE PUBLISHER"—at the Offices, 2, York Street, Covent Garden, London, W.C.**

## MEETINGS OF SOCIETIES FOR NEXT WEEK.

| Date of Meeting. | Name of Society. | Place of Meeting. |
|---|---|---|
| December 30 | Oldham (annual meeting) | Hare and Hounds, Yorkshire-st. |

## METEOROLOGICAL REPORT,

*For two Weeks ending December* 22, 1875.

Observations taken at 406, Strand, by J. H. STEWARD, Optician.

THESE OBSERVATIONS ARE TAKEN AT 8.30 A.M.

| Dec. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks |
|---|---|---|---|---|---|---|---|
| 9 | 30·41 | N | 35 | 37 | 39 | 34 | Dull |
| 10 | 30·38 | NW | 34 | 35 | 42 | 31 | Foggy |
| 11 | 30·11 | NW | 40 | 42 | 45 | 35 | Foggy |
| 13 | 30·23 | W | 37 | 39 | 46 | 37 | Foggy |
| 14 | 30·17 | W | 34 | 35 | 40 | 32 | Foggy |
| 15 | 30·17 | SW | 35 | 36 | — | 34 | Dull |
| 16 | 30·18 | SW | 35 | 36 | 40 | 35 | Foggy |
| 17 | 30·02 | SW | 40 | 40 | 48 | 34 | Foggy |
| 18 | 29·87 | S | 42 | 43 | 47 | 39 | Hazy |
| 20 | 29·74 | SW | 43 | 44 | 52 | 40 | Dull |
| 21 | 29·90 | NW | 43 | 45 | 55 | 44 | Cloudy |
| 22 | 29·61 | W | 53 | 54 | 58 | 45 | Raining |

CONTENTS.

THE BRITISH
# JOURNAL OF PHOTOGRAPHY.

No. 817. Vol. XXII.—DECEMBER 31, 1875.

## THE PAST YEAR.

**Another** year has reached its close, and we enter with some little embarrassment upon our annual task of reviewing the results of the past twelve months. We say with "embarrassment," not only because photography has arrived at such a stage of its existence as to render any great and startling changes in its principles if not impossible at least improbable, but also on account of the controversy that has arisen in connection with nearly every point which has been put forward as a "step in advance." Such controversies and differences of opinion are not to be wondered at in photography; they always have arisen, and will probably continue to do so to the end of the chapter. However, if no great revolutions have occurred during the year which closes today in the theoretical branches of our art-science, we can at least claim that its practice has been improved and enriched in more than one department.

We may, perhaps, be permitted to liken the progress of photography to the growth of a youth who, apprroaching the years of maturity and having attained his full stature, will still be some time in gradually "filling out" and acquiring the proportions of perfect manhood. So with photography; "out of its teens," it is now gradually and by slow degrees rubbing off the awkwardness of "hobbledehoyhood," and, though the annual change may be almost inappreciable at the time, it is still no less surely approaching towards perfection every year.

The branch which has, perhaps, received the greatest amount of attention since our last summary is that of dry-plate photography. This may be accounted for by the fact that it is only in the last few years that dry plates have been recognised as capable of competing with the wet process. Now, however, our leading dry-plate workers contend that their work should not *necessarily* be in any respect inferior to that produced by means of the bath; many, indeed, claim that in some respects the dry method has the advantage of the other. Amongst our leading dry-plate experimentalists we are fortunate in numbering Mr. M. Carey Lea, whose signature we have this year been happy once more to see in our columns. That gentleman's first work, upon his reappearance before our readers, was to describe a means of accomplishing what had never been hitherto practically attainable, viz., the emulsification of iodide of silver.

This discovery was almost immediately followed by the publication of his "chloriodo-bromide" process, in which the advantages of the use of an iodide and the simplicity of Mr. W. B. Bolton's washed emulsion process are combined with a new principle—that of subjecting the half-dried pellicle, in the presence of free silver, to the action of an organifier. In spite of the unfavourable opinions which arose in some quarters it is generally allowed by those most competent to judge of the value of the "innovation" that it is an improvement in many respects. In connection with this process we may "honourably mention" the name of Mr. Henry Cooper, who is always foremost in all matters relating to emulsion work.

Shortly afterwards we had the pleasure of publishing several interesting papers upon a similar subject from the pen of another American gentleman, Mr. H. J. Newton, of New York, who appears to be perfectly *au fait* in dry-plate work of every description. The greater portion of Mr. Newton's experiments lie in the direction of new preservatives and variations in the method of development; but the principal point of interest consists in forming the emulsion with a considerable excess of silver, which, after a certain lapse of time, is converted by the addition of soluble chloride so as to leave the latter in excess. The effect of this mode of working is to secure keeping qualities in the emulsion without destroying the sensitiveness in the same degree as would occur if the final addition consisted of bromide. Another novelty in Mr. Newton's practice is the substitution of tannin for pyrogallic acid in the ordinary method of silver intensification.

Captain Abney has also given copious details of his method of working the beer and albumen process with the bath. This process, which is suitable for all classes of subjects, and has secured the approbation of many competent judges, was employed in the photographic operations in connection with the recent eclipse of the sun.

While on the subject of dry plates we should also mention Mr. Warnerke's glass-substitute. This consists of a suitable paper treated with several coatings of various substances, and effectually does away with the weight and bulk of glass plates for outdoor work, as well as all danger arising from the fragility of that substance. In connection with this "tissue" Mr. Warnerke has also published a "roller dark slide," which enables the tourist to carry his sensitive films wound round rollers, instead of spread upon bulky glass plates contained in still more bulky plate-boxes, the exposure of successive portions of the tissue being effected by the revolution of a screw-head provided for the purpose.

In wet-plate photography but little change is to be recorded. The recommendation to use nitrate of uranium in the silver bath for the purpose of increasing the sensitiveness has formed the subject of much discussion, but as it has elicited such adverse opinions we must leave it to the future to prove its value. The addition of nitrate of baryta to the bath, on the contrary, continues to gain favour in all quarters.

Many suggestions have been made for the improvement of the various developing solutions, both for wet and dry plates. The first of these, which came from the continent, was the substitution of methylic for pure alcohol in the ordinary iron developer. It was said to decrease the exposure to about one-half; but, upon trial in this country, no difference could be noticed in the action of the new solution. Next came the "methylal" developer of M. Alexandre, of Marseilles, which, it was claimed, gave similar advantages to the previous one. It formed the subject for a very animated discussion, not only as to its merits, but also as to the correctness of the name given to it. In the hands of Mr. Warnerke the use of the so-called methylal proved the means of increasing sensitiveness very materially, while Mr. G. W. Webster failed to notice any gain. More recently the reintroduction of glycocoll and formic acid has taken place; but no reports have yet been received as to the conduct of these substances. In our last number Colonel Stuart Wortley gave a developing formula based upon the use of acetate of lead and formic acid in connection with sulphate of iron, which was said by him to be extremely rapid.

In the department of dry plates an inclination seems to have arisen for the use of iron instead of pyrogallic acid, and experiments

have been recorded which prove that this plan is not only feasible but highly successful. M. J. F. Plucker, a Belgian gentleman, also revived the idea of development by means of ammonia vapour—a plan which offers many advantages to the tourist. By its means plates may be partially developed while on a journey without the trouble of carrying the usual solutions, the only requisite being a small bottle of strong ammonia. It is thus possible, when necessary, to secure a picture by partial development, which, if left undeveloped for a few weeks or until reaching home, would run the risk of being spoiled; the intensification may be performed at any time. We have carefully repeated M. Plucker's experiments, and can recommend the vapour method to our readers.

Much attention has been given to the subject of pyroxyline and collodion during the year, principally in connection with emulsion work, and much valuable knowledge has been the outcome of the various discussions. M. Schaeffner, of Paris, has introduced a novelty in this direction, consisting of a pyroxyline formed from the pith of the elder and other trees, which is stated to produce a more sensitive and less structureless collodion than any other form of cellulose.

We now pass from negative work to the department of printing. In connection with silver printing the progress made may be described as simply *nil*—indeed that form of printing appears now more than ever to be on its last legs. But if the old method appears to be at a stand-still the past year has been one of the greatest activity with the various forms of permanent impression. This activity has been chiefly noticeable on the continent, our French, Belgian, and German friends appearing to take much more interest than we do in the subject. Amongst the most notable processes which have been described in our columns we may mention that of M. Despaquis, which has been patented in this country. This is a process of printing in fatty inks in the ordinary litho. press, and the inventor claims as its chief novelty the "sunning" from the back of the plate after exposure under the negative. This, however, was first mentioned as the patent of Herr Albert, and has since been a feature in other processes. The real advantage in the method of M. Despaquis lies, we consider, in his manner of performing the operation of damping and inking the printing surface.

Two other processes, which have been highly spoken of, and which have produced extremely fine results, are those of MM. Rodriguez and Gillot. They are both examples of what our French brethren term "*photo-gravure*," the image, after being formed by photographic means, being etched into a zinc or other metal plate to form the printing surface. M. Leon Vidal, as well as M. Ducos du Hauron, have both made great progress with their respective modes of working the heliochromographic processes which bear their names. The former gentleman has opened an establishment in Paris for the purpose of working his process industrially.

But the process, or collection of processes, which has caused the greatest amount of interest and discussion, is undoubtedly the combination included under the Lambert patents. There are three separate patents—the Lambertype, chromotype, and contretype—and consist, in the main, of an admirable selection of "dodges," dovetailing so well one with another as to form, in the hands of an ordinarily intelligent photographer, one of the greatest aids to artistic work ever offered. At the same time it is not to be imagined that M. Lambert's patents take the place of artistic taste or skill; it might with as much reason be expected that the mere possession of the needful apparatus and chemicals would constitute a ploughboy a photographer. But in these days of retouching how many photographers are there who aspire to a position in the art who are not possessed of the necessary art-culture to work, if not as well as M. Lambert, at least sufficiently well to make it worth their while to use the process?

In the department of apparatus we have little to notice in addition to Mr. Warnerke's "roller-slide" mentioned previously. Mr. George Hare introduced, early in the year, a novelty in the shape of his "automatic changing-box," which will prove a boon to many. Mr. Aird, of Edinburgh, also described a new form of camera for use in the field, which does away with both dark slide and plate-box. This form of apparatus appears to be a great favourite in France and Belgium, judging by the number of different styles which have recently been introduced there, but chiefly of very small size. Only a few weeks ago Canon Beechey described his split sunshade, which will be found very useful in some phases of outdoor work. Mr. Warnerke's developing dish, intended for use with his flexible tissue, will also be found of use, not only for the purpose intended, but for the development of any form of plate. It consists of a frame of ebonite, which, by means of clamps, may be fixed upon a glass plate, which latter, when properly screwed up, forms a water-tight bottom. Amongst the semi-mechanical contrivances in connection with studio work we may mention Mr. Vanderweyde's new window and Mr. Tilley's method of combination-printing, both of which are still upon their trial.

The scientific results of the twelve months have been but small. An eclipse of the sun on the 6th April gave promise of an addition to our acquaintance with solar matters; but, owing to the condition of the weather, the photographic efforts proved almost total failures. Discussions have taken place upon the results of the various expeditions to observe the transit of Venus in December last, but the full account of the joint observations has not yet been published.

In closing our brief review we can only reiterate what we said at starting—that if no great discoveries have been made, yet steady progress has been the result of the joint labours of the many contributors to photographic literature. Let us express a hope that the coming year may in no respect fall behind its predecessor, and that our readers, one and all, may experience—

A Happy and Prosperous New Year.

## INCREASING THE LIGHT IN THE STUDIO.

A sheet of white paper radiates or reflects more light than an equal angular area of sky. This assertion must be received subject to certain modifying explanations. For instance: white, fleecy, summer clouds, brightly illuminated by a summer sun, form the most powerful radiant of which we have cognisance, and excel in their luminosity the paper to which we have referred as a standard of comparison; while, on the other hand, the dull, leaden, brown clouds peculiar to our London climate during the winter months are of exceedingly little utility so far as concerns their application to purposes of photographic illumination. When a sheet of white paper or board is held up against such a sky the contrast becomes at once apparent—a contrast shown more truly by directing a camera towards them so as to obtain a negative of the paper and the sky in juxtaposition. Tested in this way the latter appears very dark, giving but a feeble deposit; whereas the former yields a dense negative, proving its radiation of a greater amount of actinic influence.

It may be said that the feebleness of actinic power is peculiar only to dull clouds, and does not apply to a June blue sky. But we venture to affirm that it is within the experience of the majority of all landscape photographers who have had occasion to take a negative in which the white chimney of a lime-washed house stood against a clear blue sky that this chimney caused such a dense deposit of silver, in comparison with the sky, as to cause the latter to print in a decided "tone," while the former remained pure and white.

We now apply these remarks to the lighting of sitters in the studio. Seeing that paper or any other material of a pure white colour radiates so much light, it is strongly advisable that, especially in dull, winter weather, every portion of the studio in the direction from which the light is allowed to fall upon the sitter be carefully utilised. In some studios the sash-bars are so thick and heavy as to obstruct a large percentage of the light; while the colour of these bars, from the effects of dark, unsuitable paint rendered still darker by time, is such as to lend no aid whatever in shortening the time of exposure.

From what has been said, in contrasting the radiant power of a pure white surface with that of a clear blue sky, it will be seen that a very large increase of light may be obtained by the obvious expedient of painting every portion of the sash bars and beams within the angle of illumination of as pure white colour as the capabilities

of our pigments will permit. By way of experiment, the photographer who suffers from such imperfect lighting as to necessitate the giving of a longer exposure than is desirable should adopt the temporary expedient of obtaining a few strips of white paper of various degrees of width, and suspending them in such a manner as to prevent the sitter from seeing any of the beams or sashes, unless they are whiter than the paper. He will, on comparing the results obtained before and after making this experiment, be surprised at the great reduction which may be made in the exposure owing to the increase of the light.

We have so frequently spoken of the great advantages of placing ground glass in all those sashes which are interposed between the sitter and any dark objects outside of the studio—such as walls, chimneys, or trees—that we do not consider it necessary to allude to them at present. But we may refer to a case of which we are aware. Here, by the insertion of a few panes of such glass in addition to the covering with tin of a portion of a broad and unusually massive sash frame, a great improvement was effected; the light was intensified upon the sitter to such an extent as to enable the photographer to obtain good negatives with about one-half the exposure found necessary prior to such alteration.

## PHOTOGRAPHY FROM A PUBLISHER'S POINT OF VIEW.

During the course of a recent visit to a large and enterprising printing and publishing establishment we had a long conversation on photographic matters with one of the managers; and as his views may not only be interesting to our readers generally, but may also serve to lead some to turn their attention to experiments in the direction from which he hopes for such valuable results, we think the following notes may not be out of place.

We may premise that this gentleman has taken an interest in photography from its early days, and is well acquainted with almost all that has been done to make it available in the production of books and in book illustration. Photographers, in his opinion, are either wanting in energy and perseverance or they have devoted their attention too exclusively to the art, or picture-producing, side of the question. They have, in the great majority of cases, expended all their strength in the improvement of those branches of the art in which good results are most easily obtained, and from which moderately-good incomes are not difficult to be secured; but have with a few exceptions, turned their backs on certain other departments in which success would be certain to command handsome emoluments, in consequence of the practically unlimited demand that would arise for such kind of work. While fully admitting the great value of photolithography and photozincography for matter in line, and of several processes whereby pictures in half-tone may be printed in fatty ink, he holds that their application must, in the nature of things, be of a limited character, and believes that the true scope of photography as an industrial art will be found to lie in the production of blocks or plates suitable for machine-printing, not only along with ordinary letterpress, but also in the production of the letterpress itself, thus showing in his expression of opinion that he has been a careful reader of our articles on this subject.

As an illustration of the nature of the work which photography may be expected to do, we were told that it was the experience of publishers generally that, in very many cases, when a first edition of a book had been successful there was a demand for a cheaper edition, which, as a rule, was brought out of a smaller size, but, of course, costing as much for setting up the type as the original edition. Now those who are privileged to peep behind the scenes in such things know that this is already done to a large extent, proofs of which we have in our editorial office, which will be shown to any who feel interested in the matter.

Again: in the getting up of works of travel geographical references occur, rendering it desirable to insert reduced copies of maps. These, hitherto, have had to be engraved at a considerable cost, and consequently were as sparingly used as possible; whereas if they could be copied by the camera, and a plate or block printable along with the letterpress could be cheaply made, the reading public would be considerable gainers, publishers would be saved a considerable outlay, and the professional photographer would find an important addition to his ordinary work, and this is now being done. The same thing applies to ordinary illustrations. We were shown, for example, a work in progress, in which it was desired to introduce portraits of Livingstone and others and copies of a large number of drawings, all of which where easily procured; but, of course, these had to be specially engraved at a serious cost, a very large portion of which would be saved if photography were more utilised in the way desiderated.

So far back as November and December, 1860, we printed in this Journal, in conjunction with the ordinary type, two specimens of Herr Pretsch's work in this direction, which, although not by any means perfect, served to show that the idea was worth working out; and we know that from that date down to the present time the subject has been more or less a matter of constant experiment. It is true that in consequence of the researches of Blair and others, which led the way to carbon printing in half-tone, experiments having for their object the printing of subjects merely in line lost for a time their charm; but the subject has, we know, been for some time resumed with increased zeal. This should be good news to photographers who are complaining of the dulness of business, as it cannot fail to give a stimulus to photographic work; and we think those who find time hang heavily on their hands might do worse than commence to practise copying, so as to be able, with ease and certainty, to make negatives of printed matter the whites of which shall be perfectly opaque and the blacks as perfectly transparent. This to all is not such an easy matter as some presume; but those who will take the trouble to look over our previous volumes will find many methods by which the required conditions can be readily secured.

## ON FADING.

It seems to be taken for granted that all silver prints must of necessity fade, it being merely a question of time—some going sooner than others, according to the degree of success in removing the hypo. in the final washing. The general *dictum* is to wash the prints to within one inch of their lives, and all sorts of ingenious apparatus have been devised to accomplish the thorough washing deemed so necessary; and yet, in spite of all this, some prints from the same batch will fade rapidly whilst others remain untarnished. This certainly would not be the case if it depended upon the washing only, for, as a rule, prints are carefully and conscientiously washed.

It seems to me that the chief reason why some prints fade and others do not is because some are properly fixed whilst others are not, and that it is the very unstable double salt left in an imperfectly-fixed print, and not a slight trace of hypo. alone, that causes fading; although if the two be combined—that is, if the prints be imperfectly fixed and a trace of hypo. left in the paper—fading sets in with grea- rapidity from the well-known action of a weak solution of hypot sulphite of soda on the double salt of silver left in the imperfectly-fixed print.

In support of this view the following simple experiment can be tried:—Take three pieces of albumenised paper (a highly-salted, thin sample is best) which I will call "A," "B," and "C" respectively. Sensitise A on Monday, B on Wednesday, and C on Saturday, printing upon all three pieces (from the same negative, if possible) on Saturday. Treat all three pieces exactly alike as regards washing, toning, and fixing, when it will be found, upon occasionally lifting the prints from the hypo. bath and looking through them, that the piece sensitised and printed on the same day will be fixed first, B coming next, and A, in some cases—in warm weather, for instance—taking a considerable time longer than C before the whole of the double salt is removed. Now, supposing these three prints removed from the hypo. bath at the time C was properly fixed, it is almost certain that B and A would fade despite any amount of washing they might receive (the double salt left in the pores of the paper being almost insoluble in water, whilst it is almost certain to be subject to spontaneous decomposition), whilst C, in all probability, would remain as permanent as any carbon print ever yet "demonstrated," requiring nothing but the hypo. to be removed, which is readily done by repeated changes of clean water.

In conclusion: I would strongly urge the adoption of the following rules:—

1. Take care that all the free nitrate is removed from the print before immersing it in the hypo. bath. 2. Fix in a non-actinic light.

3. Avoid decomposed albumen. 4. Use fresh hypo., faintly alkaline. 5. See that the prints are properly fixed by looking through each one separately. 6. Do not soak the prints, but wash well in plenty of changes of clean water. J. Barker.

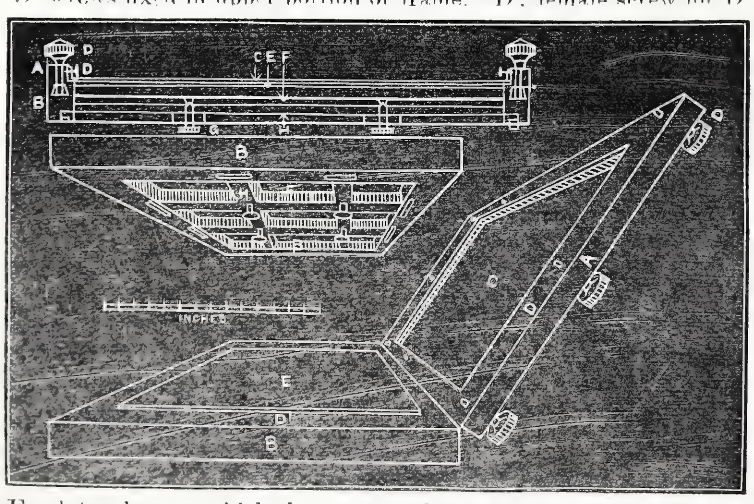
## ON A METHOD OF ENLARGING PHOTOGRAPHS SPECIALLY ADAPTED FOR THE USE OF ARTISTS.

[A communication to the British Photographic Society (India).]

Take a thin, sharp negative when photographing with a view to enlarging from it. A bath containing nitrate of baryta, as introduced by Mr. A. L. Henderson, gives most perfect negatives for this purpose. Any negative, however, will do from which it is possible to make an enlarged positive on paper.

As there are several methods of making enlarged positives on plain paper I will only point out the requirements needed for our present purpose—moderate density *by transmitted light,* freedom from stains, and general cleanliness. The development must not be pushed, and the hyposulphite of soda used in fixing must be clean, and thoroughly removed after it has done its work. Strain this enlargement before it is quite dry on a glass plate, and with a finely-pointed crayon (Woolfe's "BB" crayon in cedar is a very good pencil) put in the very deepest shadows and sharp touches; generally broader passages may be worked in with a stump, but the crayon powder used must be absolutely free from grit. Plumbago may be used with advantage in place of crayon powder. It will suggest itself here to touch in such accidental defects in the picture as may be brought up to the surrounding tint. The paint brush with sepia or fine India-ink may be used in place of pencil and crayon when one is a facile worker in water colours. Objects not in the picture may be here introduced—the shadow portions only, as the lights must all be left till later. How to introduce an impression from other negatives in combination will be mentioned later on. I here wish to confine myself to the simple process. We will call this the first portion of the operation, which closes as soon as the artist has done all he wants to the shadows of the picture. To strengthen the shadows gradually (or abruptly) a broad chamois-leather dabber may be used, dipping the same into plumbago powder, which, of course, must be dusted off so as to allow an even tint; or this may be done in the second operation.

For the second operation it is necessary to have a special printing-frame, which I proceed to describe:—A, upper portion of frame hinged to B, lower portion. C, printing mask (negative or positive) D, screws fixed in upper portion of frame. D', female screw for D




E, plate glass on which the paper to be printed on is strained. F, panel lined on the back with a single thickness of broadcloth, the surface being a true plane. G, mill-head screws for pressing E and C into contact. E and F must be able to move within the frame B in the direction of the pressure of the screw G, and not in their own plane. H, cross-bar at the back for the screw G.

The screw G being turned the plate E is pressed up into immediate contact with C, the opening in the frame being true to the opening in B through which the plate E moves.

C is a thin patent plate, and the instrument is so constructed as to relieve this patent plate C of any unnecessary strain. The plate should be as thin as may be consistent with its size and weight. A thick glass would be useless. A small rebate at the corner of the upper frame can be put in by means of a screw when the negative plate is inserted to hold it in its place; this plate must obviously be larger than the carrier of the sensitive paper.

Slightly damp your worked-up positive. This had best be done by wringing the water from a large wet towel, and spreading it out on a table, the picture being laid on its back on the towel. In two or three minutes it will be quite limp enough; on no account must it be wet. Now take your patent plate and paste on the back slips of paper an inch wide, leaving enough to turn over as will come within the rebate of the frame. Take the damp picture and lay it on the opposite side of the plate, face outside. Double the slips over and paste them on to the picture, which must now be dried equally. This must now be put into the frame where it becomes C. Before a sheet of sensitised albumen paper becomes dry strain it in the same way on E. When dry close the press, turn D home, and bring the printing surfaces into contact by turning the screws G. Your albumenised paper must be a bright sample of Steinbach's; it should be as thin as convenient. A strong nitrate bath is necessary. Two negative prints must thus be made. They are to be slightly toned and fixed, after which a rapid washing will rid them of the hypo. The strength of the paper must be husbanded during the washing. This closes the second operation.

Take the better of the two prints thus made, and lay it on its face in a retouching-frame; one mounted after the fashion of a drawing-board would be very convenient.

In touching this picture I would recommend the artist to limit his material to a superior sample of black-lead pencil—say Cohen's or Faber's "BB" or "BBB." All the sharp high lights are first put in; I should say with a tolerably sharp point. The eyes are made clear and free from the glary defects most often found in photographs. All the defects in the picture which would print dark are touched up, and remember you are working up lights now. A stump and dabber will work in larger effects. For delicate, light passages it will be better to rub the lead of a pencil on a slab and to take the powder off the slab with an appropriate stump. Bring up the lights of any accessories whose shadows already exist, and work up generally for detail where it is wanted, keeping your touches crisp. Anything out of focus very badly should be made distinct. For general effect of light take the other picture, or, rather, negative print, and put in the lights of larger passages. A cheek, for instance, which is too dark in the picture may be brightened up a bit by cross-hatching with a rather blunted pencil. All defects in this print must also be touched out.

These negatives may be rendered transparent, in which case the printing will have to be very deep indeed, on fumed paper, and the touching up must be done after the papers have been made transparent. This method will be preferred where it is an important matter to print very quickly. Moisten four strips of paper for the four sides of the patent plate, and double them down. One negative is now attached to either side of the patent plate No. 1, with its face outside; No. 2, behind it, with its face to the glass. This must be done by means of the moistened paper and paste. As these slips of paper dry they will strain the negative across the glass, which completes the third operation.

A sheet of thick double albumenised paper is now strained over the plate glass E, and a picture is printed in contact with the negative. It may, of course, be examined, and there is no danger from cockling when the paper is dry. If the paper negatives be transparent it will be advisable, when printing in the sun, to have the frame at right angles with the sun's ray. When the print has attained the depth required for the finished picture a turn of the screws at D breaks the contact between the negative and positive, and the printing is finished in this position. Where transparent negatives are used it is absolutely necessary that this printing be done at right angles to the ray of light.

When there is occasion to print portions from each of two or more negatives it will be necessary to make an enlarged positive from each negative. All but the printing portion of each positive must be entirely blocked out with non-actinic colour. When one portion has to be vignetted into another a system of masks must be employed. Where the accessories introduced from the second negative are better subdued they need only occur in the printing negative next the albumenised paper. Carbon tissue may be substituted for the final albumenised paper.

I have preferred giving a detailed description of my process, as I have known many failures occur from too much brevity in working directions given with many processes. The patent plate recommended is an expensive article; but as the negative is merely an envelope it can be removed at will, and the same glass used over and over again. It will, therefore, seem to economise the use of glass. An artist will have all the fidelity of a camera drawing in his picture, while the expression and effect—the art, in fact—will be his own. Manipulative difficulties are reduced to a minimum; where the camera ends he begins.

I have used the word "artist" several times. Photography and art are as distinct as is the work of a clerk from that of an author. An artist may do, as he has done, wonderful things with photography; my object is to point out one way in which photography may wait upon him. By an "artist" I mean a man with a cultivated mind and a well-balanced taste for art, whose eye seeks pictures in everything it rests upon. A thing of beauty is never lost to him; and he is able to communicate something of this art-sense to everything he touches. ALEXANDER E. CADDY.

## THE PRINTING DEPARTMENT.

FOLLOWING up my article on *Soft Printing* I now propose to give a few practical instructions as to how to print. There is a system in everything, and it is as easy and simple to do a thing the right way as the wrong. A good negative is of little avail if the print from it be not up to the mark; therefore, I will now proceed to give you some hints as to the management of this department.

To begin, then. When the photographer arrives at his place of business in the morning the first thing is to see after the floating of the paper. Wash the bath out thoroughly—cleanliness in all branches of photography being a most important point. Having done this pour out the silver solution, which should never be under 60° Fahr., and commence to sensitise the paper, allowing it to lie about three minutes, raising one end of it to remove "air-bells." Next lift the sheet and hang up to drip, attaching it by means of a wooden clip to a piece of string stretched across the closet, so that one corner of the paper is directly above the bath, but be cautious that no drops of silver fall upon the sheet being then floated. In the summer time, if there be over one hundred frames out, about twelve or fourteen sheets of paper will require to be done; but in the dull winter months four or five will be found quite sufficient.

Having now prepared the paper, pour back the solution into the bottle, and if it be discoloured add a little kaoline and place in the sun. Let the paper drain for twenty minutes; then dry it before a brisk fire, and cut it up into pieces suitable for the work, such as *cartes*, cabinets, &c.; let it remain in the box an hour before using, and never put the fingers on the surface, but catch it by the corners.

I now come to another subject, viz., the checking of the prints. Get a square wooden frame made, and stretch over it a piece of packing cloth; lift the prints which have been washing all night into a basin of water, and lay them out one by one on this stretcher—of course, when there are two or more of the same person lay them together. Next take the negatives and attach a slip of gum paper along the top; mark on it the number of the plate, the name of the sitter, and the quantity of copies required—twelve or six, as the case may be; but the number of the negative should also be scratched with the point of a pair of scissors upon the film in a place where it will not show, so that should the gum label come off, which is not likely unless it get wet, it will be easy to trace the negative in the books. The prints are now supposed to be all laid out on the stretcher; so take the first negative, find the print belonging to it and mark on the slip of paper how many there is off, and so on until you have finished, then replace the prints in the washer ready to be mounted in the evening. LINDSAY HOWIE.

## FOREIGN NOTES AND NEWS.

THE ENAMELLING OF CARBON PRINTS.—"SPIRIT" PHOTOGRAPHS AND "OD-LIGHT."—PORTRAITS VIGNETTED ON A GREY INSTEAD OF A WHITE GROUND.

WITH the new year Dr. Liesegang intends to commence a series of articles on the carbon process in the *Archiv*, meantime he devotes a paper to carbon prints with enamelled surfaces; but there is nothing very new in the article in question, nor does its author profess that it is more than a sort of backward glance upon the development of the carbon process during the last few years. The glossy surface, to which Dr. Liesegang makes special reference in his remarks, is produced in much the same way as in the case of silver prints upon albumenised paper. A clean glass plate, perfectly free from dust and a little larger than the picture to be glazed, is coated with wax dissolved in ether, immediately after which some raw collodion is poured over it and it is dipped in water. Then the previously-exposed carbon paper is placed in water, quickly freed from air-bubbles, and laid with the black side upon the collodionised glass plate; it is then covered with a piece of shirting and pressed flat by being rubbed down in every direction with a squeegee. After remaining in this state for a few minutes it is laid in a vessel containing water at 30° C. As soon as a corner of the paper becomes loosened from the glass the picture is drawn off, still keeping the whole under water. All the soluble gelatine is then removed from the picture by repeated rinsings with warm water; after which it is rinsed with cold water, dipped for a minute or so into a solution of alum and again washed, and then allowed to dry at a not too high temperature. The transfer to paper can either take place at once or months afterwards. For that purpose transfer-paper is dipped into warm water, the carbon print is coated with cold water, and the damp transfer-paper is placed above it; the shirting and squeegee are then applied as before. When the paper is quite dry it should spring up from the glass plate, carrying the picture with it, and the surface of the latter should be as smooth as a mirror. If the picture be pulled off before it is quite dry it will only have the gloss of albumenised paper.

In connection with the recent revival of the subject of spirit photographs, Dr. J. Schnauss, of Jena, refers in the *Archiv* to his attempts to photograph manifestations of the "od-light" which the late Baron Reichenbach believed he had discovered. These attempts were uusuccessful on the part of Dr. Schnauss; but others professed to have obtained veritable photographic representations of odic radiation, in the form of a flickering flame from the fingers of persons in motion, from the poles of magnets or of crystals, as seen by "od-sensitive" persons. These deceptions practised on the public were but a single step from spirit photographs, and Dr. Schnauss seems justified in considering the latter as but developments of the former. The next step was, of course, to consider in what way the credulity of the public might most easily and securely be taken advantage of. Soon many ways of doing this were discovered, and now anyone who wishes to obtain so-called spirit photographs may easily manufacture them to suit his own taste by one of the many methods which are too well known to our readers to call for enumeration here. Even keeping in mind the incredulity with which the scientific men of his time treated Galileo's discovery, those of today may be excused for receiving spiritualist manifestations with unbelief in this utilitarian age, when even the most ardent believers in spiritualism have been until now unable to give any satisfactory answer to the question—*Cui bono?*

One of the cardinal defects of albumenised paper as a foundation for photographic portraits is its tendency to become yellow in the whites; this is especially the case in vignettes, in which the expanse of yellowish white surrounding the head soon becomes extremely unpleasant to look at. Many expedients have been tried to overcome this tendency—amongst others, that of overpowering the yellow of the picture by mounting it upon a deeper yellow cardboard, or of using rose-tinted paper; but neither of these was entirely satisfactory. Latterly these bust pictures have been shaded to grey instead of white, so that there are no whites save the lights of the head and figure, the effect being not unlike that of pictures drawn upon tinted paper with the high lights put in with white chalk. This shaded-off ground can, of course, be easily put in by hand; but when a number of pictures are required it becomes both a tedious and expensive process. It was then found that the same effect could in a great measure be produced by placing an oval, cut out of white pasteboard, between the sitter and the objective; but the slightest move of either sitter, oval, or lens to right or left was sufficient to displace the shading at the sides, and the reflected rays from the white pasteboard falling almost vertically upon the lens and the sensitive plate fog the picture. This last effect will be very perceptible if a double plate be exposed—the first half as described, and the second after the removal of the card. Herr J. Ungar, in the *Photographische Correspondenz*, describes the way in which he overcomes it, or, at least, ensures the clearness of the middle field occupied by the bust. He constructs a cylinder either of sheet iron (the inner side varnished white) or of white cardboard, which he places at the proper distance between the lens and the sitter. If the cylinder be of the proper length—that is, about a third longer than the focal distance, measured from the front of the objective used—then there is no further preparation necessary than to place the cylinder upon the brass rod which supports it when in use. If a still more graduated or a lighter border be desired, then a very transparent vignetting cover is placed over the printing-frame.

## NOTES OF PRACTICE IN NAPLES.

WE use a substratum made as follows:—Put the white of an egg into a ten-ounce bottle, add eight ounces of water and some small pieces of glass, shake up well for ten minutes, and then let it rest until the filter is ready. I prefer filtering it through cotton rather than through

paper. After filtering add some drops of liquid ammonia to make it keep. Now take a previously-washed plate by one corner, put some of the filtered albumen into a new and clean developing-glass or cup; put the lip of the glass or cup very near the edge of the plate, so as to avoid air-bubbles, pour on the albumen, and let it run to the edges and corners; pour it back to the cup, and drain the plate into it. After a few minutes place the plate, with its face to the wall, on a pad of blotting-paper, and in twelve hours it can be used. Before pouring on the collodion pass a soft brush over the face of the plate. I do not find that the albumen deteriorates the bath.

I have found that almost all photographers in Naples stop out the skies of their negatives, the reason for this being that the sky is so very blue. I have tried many things for this purpose, but find that the following is the best:—

| | |
|---|---|
| Ammonia | 1 drachm. |
| Shellac | 1 ,, |
| Water | 1 ounce. |

Dissolve.

When wanted for use form a thick paint by adding lampblack; apply it with a very fine-pointed brush to the sky of the negative, all round the outlines of the trees, &c.

The toning bath I like best is the following:—Of one and a-quarter per cent. solution of chloride of gold take two drachms; then measure two drachms of powdered phosphate of soda and dissolve it in five ounces of water; mix. The one and a-quarter per cent. solution of chloride of gold may be expressed more clearly:—Dissolve fifteen grains of the chloride in three ounces of water and take two drachms of it to five ounces of *hot* water, in which dissolve the phosphate of soda.

1 gramme = 15 grains. $3\frac{1}{2}$ grammes = 1 drachm.

It is very convenient to keep the protosulphate of iron in a saturated solution. To make the developer, take of it five drachms; add five ounces of water and one and a-half drachm of acetic acid; a little sugar improves it.

When great contrasts between the lights and shades of a negative are desired I use the following:—

| | |
|---|---|
| Saturated solution of iron | 25 grammes. |
| Water | 150 ,, |
| Sixty-grain solution of gelatine in acetic acid | 10 ,, |

The negative will not come out hard if the plate be exposed long enough.

I conclude by heartily wishing my photographic friends—

Un Buon Capo d'Anno.

A Neapolitan Photographer.

## ASTRONOMICAL PHOTOGRAPHY.

[A communication to the Photographic Section of the American Institute.]

There having been a wish expressed here that I should give to the Section an account of my experience in astronomical photography, I will this evening endeavour to comply with the request.

There is no difference between this class of photography and some others which are hereinafter mentioned; and were it not that my experience may be of some practical benefit in eliciting discussion and, perhaps, experiment in that class of photography which requires sensitiveness combined with long exposures, I should not consider it of sufficient moment to merit attention. I have here an article which I will read, published by Mr. Rutherfurd, giving a brief description of his observatory and detailing his experience in, and method of, correcting the instrument for astronomical photography.

Photography as applied to solar and lunar work is very important, but the principal advantage derived from its application to astronomy is in star work, as it greatly facilitates determining the direction and amount of motion of the stars.

All other methods practised require experienced observers and fair nights—one demanding large salaries, the other occurring whenever the conditions are favourable, and that being less than one-half of the time. By the application of photography a cheaper class of labour can be employed. A photographer may be obtained for a few hours on fair nights, during which time he can make negatives enough of groups to keep one person employed for months in measuring, which can be done in the daylight by operatives at small salaries, and without loss of time to the principal.

There was a question, however, as to whether the photographs could be relied upon for measures of precision. Does the film, during the manipulation and drying after exposure, remain absolutely fixed in its position? This subject engaged Mr. Rutherfurd's serious attention for some time. The photographing and measuring of stars of known distances apart convinced him that the film was perfectly reliable. Afterwards, however, there being some doubt thrown upon the subject by Mr. Paschen, Mr. Rutherfurd instituted another series of trials, which I executed, to ascertain if possible the facts in the case, the results of which were published in the *American Journal of Science and Arts*, Dec., 1872. These trials satisfied us that, with properly albumenised plates, the film can be relied upon for work requiring the greatest precision.

The albumenising is a matter of the greatest importance; for if the albumen be not in the proper condition it not only does not hold the film, but is a fruitful source of trouble to the bath. My experience has led me to the conclusion that, if we could get an albumen solution in which the albumen would be entirely coagulated by a forty-grain silver bath, then the albumen would do no harm. But as only a portion of the albumen is coagulated there remains a part which is soluble in the silver solution. This is easily demonstrated by dipping three or four albumenised plates without being coated with collodion into a perfectly clear silver bath, then standing them in the sunlight for a while. The above is true with albumen in its best fresh condition, and it is still worse when the albumen has been kept for a time, no matter under what circumstances. Everything which has the property of keeping the albumen makes it more deleterious to the silver, for there is nothing that I am acquainted with which is used that has not the tendency either to coagulate or dissolve it. If we use that which has a tendency to coagulate in quantities sufficient a portion of it will be coagulated, and it is that part which is most desirable to retain; for the greater the quantity which will be coagulated in proportion to that which will not the better. If we use ammonia or the like, which has a tendency to dissolve the albumen, then in time, in proportion to the ammonia used, the albumen will be changed to a condition in which the silver will not coagulate it. In this condition it is worse than nothing. A small amount of ammonia may be used (say one drop to the ounce of albumen solution) to keep it for a short time where a person is using only small quantities, but its best condition is when freshly made and alone; then one ounce of albumen to thirty of water is sufficient. My practice in albumenising plates is to wash one and set it up between two nails, with one corner down, while I wash another and set it up in like manner. The first is then albumenised and set upon clean blotting-paper on one corner, with the albumen side towards the wall. The third plate is then washed and set up to drain, and the second is albumenised. By this method the albumen is not diluted, as the surplus water drains off, leaving the surface wet enough to allow the albumen to flow readily, at the same time the edges of the plate have dried sufficiently to prevent the albumen from flowing over on the back. The albumen may be used several times over if not kept too long.

Astronomical photography may be divided into two classes. One is very much like taking the pictures of children—that is, it requires to be done in the shortest possible space of time, as the object is continually moving; the other is like photographing the interior of buildings and dark objects, where the light is not sufficient to produce the desired effect without giving a very long exposure. The first class is solar and lunar photography. It may be asked—Does not the image of the sun and moon stand still, with the exception of a steady motion due to the revolution of the earth on its axis? I will say that they do not, and that there is where one great difficulty lies. The steady motion due to the revolution of the earth is overcome by the driving clock which keeps the telescope moving with the object; but the chief trouble in this class of work arises from the continued vibratory motion of our atmosphere. Still, if those movements were only lateral, then an instantaneous exposure, such as we are enabled to give the sun (which is the one-hundredth part of a second), would give us the desired sharpness. But there are atmospheric waves of unequal density passing between the object and telescope, which have the effect of lengthening and shortening its focus, so that the image is continually moving in and out of focus, as well as in every other direction. It is this changing of focus which causes the trouble in solar work, for there is but one chance in many that the object will be in focus when the picture is taken.

In lunar photography we are even less fortunate, for the time of exposure required to make a negative of the moon varies from a half-second at full to several seconds at the partial phases, so there is no such thing as instantaneous exposure in this work. To assist in overcoming these atmospheric difficulties our only remedy is to wait and watch; and, in case the conditions are not favourable, we are not compelled to make a blind sitting for fear of losing the customer, and then say—"Please call and see a proof in a few days;" for she is a regular customer, and if we get two or three good nights in a year in which we can make good moon pictures we think ourselves very fortunate. But with stellar work the conditions are not the same in all respects, for we do not demand that degree of stillness in the atmosphere, as there is no detail to be obtained, as with the sun and moon; still we require the maximum amount of sensitiveness in the chemicals, with additional demands on their good behaviour under very trying circumstances. It is now necessary that they shall be in such a condition as to admit of the sensitive film being kept from twenty to thirty minutes, and longer if possible, and when developed it shall be free from markings of all descriptions. The stars not having the same amount of motion, either in rate or direction, it is desirable to get as many as possible in each group; for by so doing we obtain a

greater amount of information with the same labour. Even with the longest exposure which can be given, and the utmost sensitiveness of the chemicals, assisted by a supplementary exposure to light (which increases the sensitiveness about one-third), there still remain vast numbers of stars beyond the reach of photography in its present state. To show the increase of sensitiveness by a supplementary exposure to light I have here the original plate which revealed to Mr. Rutherfurd that fact in March, 1866. A candle was standing so that its light fell upon one side of this plate, and you will see a very great difference in the sensitiveness; for the stars, which make no trails on the unexposed portion, make strong trails on that part which was exposed to the light. These trails are lines made by the stars while the telescope is standing still, the same as the streaks made by bright objects passing in front of the camera when taking views. The advantage derived by this treatment was so decided that it has been in constant use in this class of work ever since. By it we are enabled to get stars smaller by at least one and one-half magnitude.

As all our work requires to be done in the shortest possible time, my first experiment was to get a collodion which should combine the greatest amount of sensitiveness with stability, if possible, as it would sometimes be a week or more between the working nights. The advantage of having a collodion in good working order at all times is of great importance. In order to make reliable tests for sensitiveness it is necessary to have some means by which to compare the results with considerabie nicety. To do this I constructed a photometer as follows:—Taking a piece of wood about two feet in length and one inch in height I fixed a gas burner to one end and about six inches in front; then I placed a row of cylinders covered with white paper on the top of this piece of wood, so that each succeeding cylinder ranged one inch farther from the light; and, as the illumination received by each diminishes in proportion to the square of the distance the cylinders are from the light, negatives made of these will very readily show the relative sensitiveness of the chemicals employed, if the light and time of exposure be so reduced that in no case shall all the cylinders make an impression on the film.

I have made nearly one hundred trials for sensitiveness, and have kept a record of how each was made and of its qualities. The most important element for sensitivenes is in the cotton, and the relative proportions and purity of the alcohol and ether of which the collodion is made. That cotton which burns quickest and dissolves rather slowly, leaving a small amount of sediment, and making a rich, creamy film, when fully sensitised and salted with about four and a-half grains of cotton to the ounce of collodion, is the most sensitive. Cotton which makes tough, horny, and nearly transparient films works slowly, but can be improved by using an excess of alcohol. The ether is often acid; this is also very detrimental to sensitiveness, and has at times given me considerable trouble. I have never had any difficulty with Atwood's alcohol. The albumen should be used as thin as possible where sensitiveness is required, as that also has a retarding influence. With regard to the salts employed I have not found any material difference in sensitiveness, but each has peculiarities of its own in other respects. There is one point in the age of an ammonium collodion where it is equal to any other, but that period is of short duration. A combination of magnesium and cadmium gave good results, but there was not difference enough to make it of any advantage to use. Of all the different kinds of salts there are none better than cadmium for my work; it has sensitiveness equal to any, with stability combined, and may be used as soon as made. The amount of salting I use is six grains of iodide and two of bromide to the ounce of collodion, with sufficient tincture of iodine to give it an orange celour.

The next question was whether very sensitive chemicals would stand long exposures. In testing this question I found that it required a little more acid in the bath for long than for short exposures, which diminished the sensitiveness slightly. The chief difficulty I had to contend with in long exposures was "matt silver." I have examined every work on photography within my reach, and do not find one that gives either the cause of or cure for this trouble. I was annoyed with it more or less until one summer I had what may be called an "epidemic." One set of chemicals was extremely rich in producing it.

I did not seek to get rid of it, but rather encouraged it, in order, if possible, to find its cause. My first experiments were to produce the same effect at will; this I considered would be the key to both cause and cure, and so it was. The results of my experiments proved that by adding some organic matter like gelatine to an acid bath I could produce beautiful specimens. It proved to be a deposit produced by the action of the atmosphere on the compound of acid, silver, and organic matter. It requires all four to produce it; and as I was at a loss to see how I could get along without the atmosphere or silver I was obliged to turn my attention to the other partners in the transaction. Being obliged, as I am, to use albumenised plates which constantly add organic matter, it is impossible to keep the silver solution free from it for any length of time.

I find also that collodion made from certain kinds of cotton furnishes the bath with organic matter. It appears that the action of the acid in the manufacture of the pyroxyline renders a portion of the collodion soluble in water, which washes out into the silver solution. In precipitating the cotton by water, out of different samples of collodion I found that some lost more in weight than others. I then evaporated some of the water, and found quite a quantity of organic matter had been washed from the collodion. I wish some further experiments might be made in this direction. It is a well-known fact that neutral silver will precipitate the organic matter in strong sunlight; it will also do it in the dark, but not so rapidly. The nearer neutral the silver solution is the less organic matter it will hold in suspension. I find that a neutral solution works well for short exposures, when the plate has not been allowed to remain in it over three or four minutes and is developed immediately after. But in long exposures the neutral silver will fog, and so will the acid solution, if there be organic matter present; but these two classes of fogs are of an entirely different character. The first, or alkaline, fog is entirely under the film, and cannot be wiped off without disturbing it. The other, or acid, fog is wholly on the surface, and may be wiped off without breaking the film. This acid fog is what makes "matt silver," when it gets thick enough to produce streaks, which adhere to the film during long exposures. The larger the amount of acid in the silver the greater the capacity for holding organic matter, and the thicker will be the surface fog with long exposures. With an acid solution there is little or no precipitate of organic matter; but if the silver be nearly, or quite, neutral then the dipper and sides of the bath will be covered with a dark deposit of organic matter. So if the solution be not overworked it will keep itself clear from the "matt silver" trouble, if the scum which floats on the top of it be frequently removed. One test I have for acidity (which is a very good one) is to touch the surface of the collodion film with my finger in several places before dipping it in the bath (using a finger which has no chemicals on it), and when the plate is developed if the places touched do not show any darkening more than other parts there is too much acid present. I then add soda or ammonia to the bath carefully until there is a slight darkening of the spot touched. Sometimes it is a dark ring on the edge of the spot; at other times there are dark spots representing the markings in the cuticle, this depending upon the amount of pressure and quantity of organic matter left on the film (if it be too alkaline the spot touched will be very black all over or nearly so). This is, as far as I know, a new and very delicate manner of testing the right amount of acid in the bath.

In conclusion: I find the best way to keep clear of the above trouble is to keep the silver solution as nearly neutral as possible, and steer clear of the alkaline fog. Filter often, and do not let the plate remain in the bath over three or four minutes; then draw out quickly. By so doing the scum is prevented from adhering to the film, by the solution which is in contact with the plate rising and flowing outward at the surface, leaving nothing but clear solution on the plate; and if this be not surcharged with organic matter there will be no surface deposit. If my film have a fog on the surface which can be wiped off I add to the bath a dilute solution of ammonia or soda, and when the proper quantity has been added it will work beautifully clear and quick if there be nothing in it to produce fog but organic matter. D. C. Chapman.

## "THE LADIES OF THE PROFESSION."—SKETCHES.

### Sketch No. 3.

My friend Jones was a liberal-minded individual, who, in an unguarded moment, committed himself to matrimony. Now he was not what the world calls a "marrying man," and nobody could be more surprised at the announcement than myself when I received the orthodox cards tied with a true lover's knot. "Jones married!" I soliloquised. "Never!" Yet so it was. Those snug little supper parties, that prime old cognac, those anecdotes (Jones was strong in anecdotes) would they be ended for ever and be superseded by the—I won't anticipate!

Absence from England had prevented me calling on the happy couple for nearly eighteen months. Now, on my return, I fully meant to take an opportunity of doing so. As if to anticipate my intention I met Jones down in the city at an optician's, where he was selecting some apparatus. "Is that Jones?" I said to myself. No! yes! but what an alteration! Where was the ruddy and cheerful countenance, the sprightly manner of old Jones?—vanished entirely! Jones, the Jones of old no more.

I slapped him on the shoulder, with—"Well! old fellow! How are you? I must congratulate you, though rather behind-time. Eh! Jones? How's Mrs. J. and family?"

"Don't, for goodness sake; don't congratulate. Sympathise, my boy, sympathise. Oh! Lord!"

I thought Jones was poorly, but he wasn't.

"I never was a marrying man, Ned," he continued. "What on earth possessed me I don't know; but I am now, I am now," and he groaned in the spirit.

"What's up, old fellow? Anything wrong?" I inquired.

"Everything's wrong, everything's wrong! Oh! that I should have been such an ass!"

"You are out of sorts, Jones. Come, let us have a bit of lunch over the way and a chat. It will do you good," I continued. With a deal of hesitation he consented, furtively looking right and left, finally darting across the road into the *restaurant* as if he were afraid of being seen

Jones—who had been the leading spirit and first proposer of little snacks—acting like a schoolboy in a forbidden apple orchard! What had come over him? Visions of the little suppers of old seemed to recede still more into the obscurity of doubt; and those jolly whist parties, were they never to be renewed, but only to be remembered as things that were during my absence? I had often in memory recurred to those pleasant episodes and longed to renew them. I felt a little damped, to say the least of it. By the time our lunch was ended, and some of Jones's special tap consumed, he seemed more himself—warmed up as it were—went so far as to order another bottle and propose the theatre; in fact, he became quite hilarious. I never recollect Jones so affected with a glass before. He had not been used to it lately, that was evident. We, however, made a call or two, and finally went to the theatre. As time went on the effects of the wine went off, and fear began to take possession of Jones. At last he burst out, "Come home with me, Ned; there's a good fellow! Do; Mrs. J. will be in such a fury, and you were always a decent fellow in tackling the ladies."

I could but agree, and as we sallied forth Jones was very quiet, and scarcely spoke a word till we arrived at his domicile. He fumbled about nervously for his latch-key, and when he found it could not make the latch move; it was evidently fastened inside, and there was nothing for it but to ring the bell. We waited, rang again and again, but with no response. Presently a shrill "who's there?" came from the inside.

"It's me, darling," Jones squeaked out, "and an old friend from abroad."

"A pretty time of night to bring old friends here. He'd better go home! There's no fire; we are all in bed!"

On consideration I thought I had, so I bid Jones good night and promised to call in the morning. I felt sorry to leave my old friend all the same, but what was the use waiting? So with a squeeze of the hand and a little further encouragement we parted.

"Is Mr. Jones at home?" I inquired next day when I called at his place of business.

"No, sir; but madam will see you. Please step in."

I stepped in and found myself face to face with a strong-minded female, who sat at a desk holding a pen between her lips, and engaged in book-keeping or something of the kind. I fancied she looked cross, but might be mistaken. I repeated my inquiry for Mr. Jones. She looked more cross, and asked me my business. The moment she spoke I recognised the voice of the immovable one of the night before, and saw my position at once. "Now for it!" I thought to myself, and in as bland tones as I could muster I stated my name and business, which was to pay them a call of pleasure, not of profit.

Mrs. Jones drew herself up; her expression was not amiable, and said—"Are you aware, sir, my husband is averse to pleasure of any kind during business hours? He has found the pursuit of pleasure inimical to business interests. After we close, which is precisely at seven, I have no doubt he will see you a short time should you please to call. We retire early. Good morning!"

She resumed her pen, and having thus received my *congé*, I departed, determined nevertheless to call after business hours, and, if they did retire early, break through their rules for once. Jones was alone when I called at night, apparently deeply engrossed with some publication which I saw was entitled *Footprints of Satan*.

"Hallo! old chap! Studying theology, eh?" I fancied I could discern a twinkle in his eyes as they caught mine, and he laid down his paper. If it was it soon vanished as Mrs. J. came sailing in, vouchsafing me a cold and distant bow. Then, quite ignoring my presence and addressing her spouse, she said:—"John, shall you be ready to accompany me to lecture at nine o'clock? Mr. S. is a very good Christian, and his discourse might edify you?"

"Well love, you see"——

"Yes, dear, I do see. You prefer staying away to haunt those dens of vice and get headaches."

"But"——

"Oh! you need not 'but!'"

"But my old friend, whom I have not seen for so long."

"Since last night" briskly interposed the lovely Mrs J.

"The murder is out," thought I, so I may as well say something.

"Pardon me, madam. Your husband *is* an old friend of mine—I may say, a dear friend—whom I had looked forward to meeting again; but if my call is objectionable I will say 'good evening.'" This was met by silence on her part, if a sniff could not be said to break it.

Jones spoke up and said—"Stay! Of course. I'll stay with you. My love (addressing Mrs. J.), you won't mind going tonight without me for once?" Thus appealed to, Mrs. J. remarked—"Of course the wife is a secondary consideration now. You used to be glad to go out with me at one time! Anyway *I* shall go;" and with a formal bow to me in passing she left the room.

Jones seemed much relieved in his mind when this took place, and soon after the slamming of an outer door announced the fact that madam was as good as her word, and had gone. Jones rushed to the window, and peeped round the blind to be quite certain, and then threw himself back in his chair with a sigh of relief, and the first words he uttered were—"Ned! My boy! Never get married!"

I promised to bear it in mind. He soon afterwards rang the bell for supper, when, with a blank face, the servant said—"Missus has locked all up and has taken the key, as she intends to be at home for supper herself after lecture."

Jones's face was a study. He was not given to swearing. I may say he never did swear; but he made some remarks the best imitation of it I ever heard. He pitched his theological tract into the fire, and behaved himself in an eccentric and extraordinary fashion generally.—Had the last straw broken the camel's back? Anyway he seemed more himself for the remainder of the evening. After disposing of sundry tumblers of grog (obtained from a "pub" round the corner, for the spirits that had been locked up too) he was positively jolly. I must say I left him in a much happier frame of mind than I found him.

Mrs. J. did not turn up again that evening whilst I was there, a fact which struck me two or three times over before I went.

Some time afterwards I saw Jones and he confided a little story to me; but that's private. Anyhow I went again more than once and Mrs. J. had much altered for the better; so much so, that Jones told me that marrying was not, after all, such a very bad thing. E. D.

## A MOVABLE DARK ROOM AND UNIVERSAL CAMERA FOR THE STUDIO.

My idea is simply a darkroom upon large castors, the size being according to requirements. For an ordinary studio one made about four feet six inches by four feet would do well to work plates from one-ninth to whole-plate, or even ten by twelve. The "carcase" could be made either of "cleading and framing," or frames covered with thick, black twill; or, to please the fancy, it must have door, glass window, with yellow glass, floor and roof. Inside must be a cistern to hold sufficient water for half-a-day's work, with sink to hold the same quantity.

On one side there should be a movable shelf to act as the base-board of a camera with slit and binding screw at the back part, where the focussing-frame should be. All that is required is a rabbeted frame with carriers for different sizes of plates, held in their place by a simple spring, and at the front two fixed upright grooves for the sliding fronts. These would have to be sufficiently long to exclude the light when this peculiar camera was raised or lowered.

Another method could be adopted, by which the focussing may be done by racking the lenses in and out, instead of focussing only with the screen. This any mechanic could accomplish by cutting a slit in the front of the dark room, so that only the nozzles of the lenses need project.

For use, the dark room must be placed in the position the camera would have occupied, and, while the principal is talking and posing, the operator—or, as some have said, "that dirty, dirty man"—could just raise or lower the lenses, base-board, &c., by placing a piece of ground glass in the carriers, coat his plate, and, when the sign is given, expose, &c.

The advantages are many. Some small studios often require the very place the dark room occupies, much to the sorrow of the proprietor. By this means a small studio seventeen feet long could have a background at both ends; it also would possess a means of local masking, to say nothing of seeing when to stop the exposure by the sitter moving. It would keep operators out of the way of nervous people and children. There would be no need of stratagem in a case like this. All I can say is that, if the idea suit the readers of the Journal, they are heartily welcome to use it as they think fit. A. F. Fenton.

## CULLINGS

### From the Sixth Convention of the National Photographic Association of the United States.

Mechanical Appliances for Governing Light. — Mr. C. E. Myers: This paper will mainly be confined to such matters relative to the subject as are already on photographic record in our various journals, and for motives of general interest this selection will be made for the most part among such contrivances as have been in some way illustrated. Obviously the light itself is of the greatest importance. By this term "light," is not meant simply the form of skylight, but the light itself. The main thing is to get enough of it, of good quality, and from one general direction; these matters have in general been settled, and as convenient methods of admitting light two quite distinct styles of openings have sought favour. The practically-successful opening is the usual north top and side light. The theoretically-perfect style is the so-called "tunnel light," the principle of which is to light the subject and not the camera. Most of the lights in use are such modifications of these two designs as the varying construction of the edifice, or faith, or whim of the artist make expedient. The cry for "more light" having been considered the next thing is what to do

with it, and at this point it is discovered that light, like fire, "is a good servant but a bad master." In other words light is obstreperous, and various contrivances, consisting of curtains, shutters, shades, blinds, screens, and reflectors, ingeniously tangled with cords, pulleys, poles, and balancing weights, are brought into requisition. Passing to those used inside the room the ordinary window-curtain sliding on rings and wires has first received attention, and for a side-light screen this still continues among the best, being cheap and easily adjusted in sections to cover the whole or part. Next comes the rolling shade, the better form of which is the "spring shade," excellent for top lights, as they take up little room and adjust to any position. The ordinary sliding shutters are effective, but much too cumbersome and expensive for general use or on large lights. One style of swinging curtains is much to be recommended by reason of its cheapness and efficiency, the only objection being that, when thrown open or not in use, the amount of light is considerably less than that of an open light. This style is formed of both frames covered with cloth, and suspended by screw-eye hinges from the rails of the skylight; they are then connected in gangs or sections and swung by cords. These three or four methods or their modifications comprise all the styles that have proved either cheap, practicable, or convenient appliances not movable about the room; and these have also been mounted on portable frames and used near the sitter. Among the portable contrivances for modifying the light by reflection the first receiving much public attention was Kurtz's "patent Rembrandt counter-reflector," exhibited at the Cleveland Convention. I here show you a model in cardboard. It consists of an open frame, nearly square, on wheels, and having a reflector hinged to the interior of its four sides. On each outer side of the frame is hinged a frame containing a tilting reflector, the intention being to reflect light variously on the subject. Next comes Adam-Salomon's "alcove background" and system of lighting. It consists of a recess background 8 × 10 feet, with one or more swinging screens hinged to its top, and controlled by cords to cut off top light. It also has ring screens attached to each side. The entire alcove rests on castors so as to be movable under the light. This is one of the early forms of skylight, or tents within a skylight, to which the usual curtains or screens are attached. Next comes Kent's hand-screen, with which I suppose you are all familiar. It consists of a square framework covered with tissue-paper or cloth, and is wielded by a long stick in the hand of the operator. There is no doubt about its efficacy. Mr. Kent's proposal to patent the apparatus, to prevent its being stolen and patented by some unscrupulous person, was pretty generally misunderstood by the fraternity, who at once benefited the world by hunting up similar contrivances. Among others Mr. I. B. Webster takes decided grounds against the screen, because it has to be held in the hand or moved during exposure, and, adducing twenty-five years' practice against theory, says:—"The more quiet the room is during the sitting proper the more perfect and satisfactory the expression;" and he claims very properly that the principle of the movable screen is not patentable but common property, though any particular or original pattern of construction may be patentable, leaving it with the fraternity to buy such pattern or not, or to construct and use any other different pattern. He proposes, as the proper method of introducing any good pattern, to manufacture it and place it on sale at a moderate price, instancing Bigelow's background as being well contrasted with the idea of a speculator who invests in a patent right for a plough, very good in its way, and who then claims to cover the whole system of ploughing, and that the honest farmer must either buy his right or quit ploughing. Among the various novelties brought to light by the misunderstanding of Mr. Kent's position is Mr. Manville's, which, although so similiar to Mr. Kurtz's counter-reflector that I may use the same model to illustrate it, differs mainly in having a screen like Mr. Kent's attached by a bolt to a bar across the middle framework. It was adjusted in position by a brace attached by screw-eyes. It could be raised or lowered in the frame, and had a motion through the arc of a circle in two frames substantially at right angles to each other, and the screen itself could revolve about the end of its supporting bar; in fact, it was a screen with a restricted universal motion, and was only faulty in being cumbersome. Mr. B. F. Hall's universal screen is made of printing-paper pasted over a wire hoop, to which is attached a small tin pipe, fitting snugly upon the head of a jointed bar, the other end of which stands in an ordinary head-rest column. The joint is made fast by a thumbscrew. The arrangement can be illustrated by a palm-leaf fan jointed by the end of its handle to an upright shaft. This makes an universal joint by which any angle can be given and retained in the screen end. Up to this date nothing better has been described in any photographic publication. Since the National Photographic Association has presented to its members, through the courtesy of Mr. Kent, his hand-screen proper, together with the result of his large experience in its use, the science of lighting has been greatly simplified and practically reversed in the actual theory of controlling it. The first theory was to let in the light only when it was wanted, as in the system of Mr. Stortz, whose principle was illustrated by a model studio, with shutters numbered, the various effects to be got by opening particular shutters found by experiment to correspond with various lighting effects. The best illustration of this method is *Bigelow's Album of Lighting and Posing*, published May, 1872, in which the attempt to reduce it to an accurate system is only prevented by the varying feature of the subjects themselves, nearly all requiring some individual variations to modify effects, as when a round face is substituted for one with cavernous cheeks and eyes. As alluded to the screen system is exactly the reverse of all others, and the sitter is usually placed at or near the centre of illumination, while the method itself is the barbarous "role of application," whereby a plug may be fitted to a hole by cutting and trying. This gives free scope to the variations in different faces; but it is in a degree useless in the hands of those not possessing also the artist's eyes, as the particularly favourable light has to be detected as the screen moves about. This accounts for the reason why photographers who are not real artists have not sooner admitted the merits of the hand-screen and so constantly used it. With natural taste or with practice this use of the screen becomes intuitive, as any required effect can be got in less time than it takes to adjust a head-rest. In October, 1873, the *Philadelphia Photographer* published a contribution illustrating and describing another arrangement of the screen, the model of which I now present. It consists of two sticks crossed to form a base. From this rises a stick six feet high, with a screw-eye at its top; near the top is a block of wood clamped to the post by a screw-eye. This block hinges to an arm carrying a square frame or screw, to which is attached a cord passing through the screw-eye at the top of the post and terminating in a balancing weight. The contributor's name is not given. If it be claimed by any one present, will he please mention it. This apparatus can thus be cheaply made by any one of slight mechanical skill, the only fault in its plan being that its movements are limited to arcs of circles, in planes, in right angles to each other. When I became an amateur photographer I commenced experimenting in the direction of appliances for governing the light, and if I should be found speaking as one having authority please consider that in pursuing a speciality I have probably had a larger experience than any other person. I kept a bright look-out through the various journals, and I made numerous arrangements for modifying light, and took my pay out in that way. They did not suit me, but I could no more help trying than a hen with an egg to lay. What I wanted was a screen weighing less than four ounces. I also wanted it movable by one hand like a fan, and I was foolish enough to want it to remain in the air, suspended, as my hand left it, in position. The war-cry of American "cheek" is "*eureka!*" It is here. Two sticks four feet long cross to stretch the screen, fastened by four tacks; this third stick, four feet long, has a weighted handle at one end, while the other end is screwed to the crossing of the screen-stretcher. Near the handle the staff passes through an universal joint made spherical for symmetry; this completes the attachment, its weight complete being two and a-half pounds. It is wielded by the handle like the common hand-screen, and a socket in the sphere slips over the top of any head-rest shaft. As a preferable support I use a head-rest base of iron, a column of wood with a metal cap forming a binding-screw, to adjust the height of a shaft of hard wood or gas-pipe, making the whole light, cheap, easily carried, and hard to upset, because its weight is in its base. The arrangement of the joint is such that it permits complete revolutions of the screw in any plan, and by a "twist of the wrist" to occupy any angle or position as freely as a hand-screen not attached, and it is so perfectly poised that it remains firmly fixed when the hand lets go. If you want a hand-screen, here you have it. If a fixed screen, here you have it. If you want a flat reflector, here you have it. If you want a concave reflector to concentrate light on any one spot, the loose screen when inserted sags into a concave surface. I trust that its perfect simplicity, lightness, and cheapness will not seem objectionable, as by ten minutes' practice with it as screen and reflector the true science of lighting is better revealed than by days with other methods. In connection with this simple attachment I have had a large experience with the character of the screen employed. It seems natural to always think of the screen as thin enough to transmit considerable light. This is as great a mistake as to put ground glass on an excellent north light. Translucent screens soften or modify light, but do not govern it; but this is accomplished by an opaque, or nearly opaque, screen. With either more brilliant effects are got, and softness, also, by a similar screen, or by moving it farther away or out of the camera view. The opaque screen I also use advantageously over the camera itself, producing all the good effects of the tunnel light without its defects. As a semi-opaque screen I have always used the various coloured paper cambrics, more or less non-actinic, or approximating to the colour of the blemishes of the face, such as freckles, tan, or sears, thus materially reducing the retouching of negatives, as the face is lighted all one colour. Some years ago the screen here shown was a fine healthy pink, but the sunlight has had its revenge on it for being controlled, and leaky skylights have convinced me that there are some things which a screen will not do. I brought this along, because photographers love the older relics of their art. I can well believe that there will be some difference of opinion regarding my statements relative to the effects of the opaque, semi-opaque, or coloured screens, but I respectfully ask the fraternity to investigate the matter first, as I believe that an experience considerably less than mine will corroborate my views; the cheapness of the screen-stretcher, attached by a screw-eye, facilitates a change in the character of the screen in use. It may be asked if my apparatus is

patented. Luckily for the fraternity it is; and it was not patented to persecute the craft, but in a hurry to foil an attempted piracy. I concluded to pay thirty-five dollars to Uncle Sam for a patent rather than give ten or fifteen dollars to "any other man" for the privilege of using my own invention. It rests on its own merits of simplicity, cheapness, and efficacy, and I do not intend to prosecute individual infringers. I will give a license to make a screen or reflector to any person who would rather pay for the trouble of merely writing it than for the perfect apparatus itself. I think I can offer a better article, cheaper than they can afford to tinker one up, and adjust its peculiarities by experiment. I would remark that this is not a "light modifier," but a "light controller," capable of making a properly-lighted head in a blinding glare of sunshine, by a common side window, or at the bottom of a well big enough to work it; and I present it to the fraternity to be by them wielded as a painter's brush, applying the light when needed. I now regret that I did not make this model larger, but it really shows the working of the apparatus, and an idea can be gained from it.

## Correspondence.

Schlippe's Salt.—Chloro-Bromide Plates Made Without Washing.—Use of Chlorides.—Testing for Hyposulphites.—Capacity for Development.—Partial Screening of the Image.

I ask the patience of your readers for a few moments whilst I rectify as briefly as possible certain questions of priority which have presented themselves during these past months.

*Schlippe's Salt.*—Mr. Dallas, in a recent letter, praises this mode of intensifying, and proposes as new, and as an improvement on my method of chlorising, the *iodising* of the film. A reference to your volume for 1865, page 55, will show him that this is the method which I originally published. The chlorising I proposed subsequently only, viz., at page 112 of the same volume.

*Chloro-Bromide Plates Made Without Washing.*—Questions of priority sometimes take an odd form. About eighteen months since I described in your pages a method of making dry plates by plunging them directly into the preservative without previous washing. I was quickly told that I was "following in the footsteps" of Canon Beechey, as that gentleman had already proposed the same method of operating. A reference to my note-books showed me that I had used the method at a very much earlier time than I supposed when I wrote the paper; but believing that I had not established my priority by publication I let the matter pass, not caring to make a claim that could not be substantiated by a reference to it in print.

Lately, in looking over a back volume of your Journal, I found that so far back as 1868 I had described this method of operating very fully. My paper will be found at page 97 of that volume. I not only dwelt upon the advantages afforded by that mode of proceeding, but gave the result of a careful comparison of plates washed and unwashed, showing very conspicuously the greater sensitiveness of the latter, calling attention in italics to to the entire novelty of the plan. I also referred to it in the next volume (1869, January 15), and expressed the opinion that it would supersede the older method. And in the *Philadelphia Photographer* for 1868 I also described it (page 84). When I described the use of this method with an albumen bath in your volume for 1874, at page 219, my former experience with it had quite passed out of my mind. The publications to which I have referred will, I presume, effectually settle the question of priority between Canon Beechey and myself.

*Use of Chlorides.*—In a letter published in your Journal for November 5th, Canon Beechey remarks that the difficulty in intensifying sometimes experienced is (in his opinion) due to the use of nitric acid, and this he purposes to avoid by using hydrochloric acid "to the exclusion of *aqua regia*, or nitric acid *in any shape.*" He was led, he remarks, to "try the effect of pure hydrochloric acid, by which a chloride is formed and *nitric acid is liberated.*" How, then, is nitric acid excluded "in any shape?"

At the same time that Canon Beechey thus lucidly defines the action of hydrochloric acid, he goes out of his way to introduce an observation attributing to Colonel Stuart Wortley the honour of fixing the function of chlorides in emulsion work. What can be Canon Beechey's object in so unnecessarily reviving this matter I cannot imagine. The assertion is in itself utterly incorrect, and Canon Beechey must have known that its direct effect would be the renewal of a discussion much better let alone. And I must say to him that the *camaraderie* by which these two gentlemen mutually support each other is sometimes carried a little too far.

This use of chlorides in emulsions was a matter of which I had made a special study long before Colonel Wortley first occupied himself with it. The absurdity of Canon Beechey's statement drew out a protest from Mr. Howarth (to whom my thanks are due for his friendly remarks), and this seems at once to have drawn a letter from Colonel Wortley, though the issue to which it appears has not reached me, having been apparently lost in the mail, and I know of it only by an allusion in the following number.

As I have elsewhere sufficiently proved my position as discoverer of the utility of chlorides in emulsions, I do not think it worth while to take up your readers' time with a repetition. It will be quite sufficient to cite the testimony of an unprejudiced and independent observer as to the real bearing of the matter. After it had been fully argued in the pages of this Journal the Editors wrote:—

"Let there be no mistake concerning *our* opinion as to what Mr. M. Carey Lea has done for the collodio-bromide process. Although we have sometimes differed from him with regard to matters of detail, there is no doubt whatever that Mr. Lea has been the first to render this process a highly-sensitive one. *From his having advocated as one of his fundamental principles the use of a 'large excess' of nitrate of silver, and this at a date anterior to that at which Colonel Wortley read his paper, any claim made for or by the latter gentleman for original discovery in this special line cannot be sustained.* Mr. Lea was first in the field; let us not grudge him the laurels he has so fairly earned. * * *Mr. Lea was also the first to use a chloride with the bromide.* The principles of the *addition of a chloride* and of an *excess of nitrate of silver* belong to Mr. Lea."—The British Journal of Photography, *Dec.* 29, 1871, page 619.

This testimony is sufficient; I therefore pass to another part of the question.

It is an error to suppose that chlorides, nitric acid, or hydrochloric acid are as reliable as *aqua regia.* The difference is this—that with some forms of emulsion and some collodions these different substances give satisfactory results. *Aqua regia does so with all.* No one who will make an emulsion according to the formulæ which I have published will encounter fog. If he have an unsuitable pyroxyline he may get thin images, but he will have fog never. If he depend upon the presence of a chloride he cannot be equally sure of obtaining clean plates; something will depend upon the nature of the preservative. *Aqua regia* gives clean plates with all preservatives. In 1869 I thought the mere presence of a chloride sufficient; afterwards, with more varied experience, I found that it was not always quite safe to depend upon it.

The true function of a chloride is to impart density to the image and to facilitate a satisfactory development. When, as I have advised, two grains of cobalt chloride and two drops of *aqua regia* are used to the ounce of collodion made with an intense pyroxyline, there will never be the least difficulty about density. Of the large numbers of persons who have used my chloro-bromide process I have never had complaints from anyone as to want of density. Neither does nitric acid (when contained in *aqua regia*, and probably not under any circumstances) tend to thin images difficult to intensify.

*Testing for Hyposulphites.*—Dr. H. Vogel has lately published a method for testing for the presence of hyposulphites. This method is simply that of iodide of starch, originally published by me as far back as 1864 (*Philadelphia Photographer*, April, 1864), and since many times claimed by others. Dr. Vogel himself published it as original, in a letter to the *Philadelphia Photographer* some years later (reprinted in The British Journal of Photography for February 1, 1867), and was reminded by the Editors (p. 51) and by myself (p. 139) that it was not new. I had then had it in use for four or five years, and had published it three years previously.

*Capacity for Development.*—In a communication sent to The British Journal of Photography a few weeks ago I endeavoured to explain why, although silver iodo-bromide was more sensitive to light than either silver iodide or silver bromide taken separately, yet the dry process did better with excess of bromide and the wet with excess of iodide, rather than by using both in equivalent proportions, as would seem most reasonable. This I endeavoured to explain by referring to the fact that sensitiveness to light and capacity for development are not only not the same thing, but do not even necessarily go together. It is a pleasure to find that the Editors agree with me in this, and have independently expressed the same view as to this distinction. The opinion is one that I have long entertained, and as far back as 1868 I expressed it in the columns of this Journal (1868, page 504). In fact, if these two properties were identical, or even essentially connected, then any given development ought to do equally well for all sorts of plates, which is very far from being the case.

*Partial Screening of the Image.*—A great deal of ingenuity has been expended upon modifications of the sky-shade, of which that lately

described in your columns by Canon Beechey is curious and interesting. Perhaps the cleverest of all is one which was patented some years ago, and consisted of a number of flat pieces of wood with pointed ends, with "slots" through which was passed the axis of the shade. These pieces were then pushed down one by one until their extremities corresponded with any contour of sky. Another plan was to fasten a piece of soft leather in front of the lens, the lower border of which was fastened over a piece of lead wire. This wire could be bent into any shape to follow the sky line. This seems very ingenious. None, however, have come into any extended use, and I am still disposed to think that the inclined diaphragm originally proposed by the late Mr. Reade, and afterwards by the late Mr. Sutton, is, perhaps, the most generally useful, combined, of course, with the ordinary sky-shade.

Unless the contrasts are very great, they can be mastered by a good chloro-bromide or chloriodo-bromide plate very satisfactorily—better, I think, than by any description of plate made with a negative bath. Last spring I remember sending you a $6\frac{1}{2} \times 8\frac{1}{2}$ print, in which a dark ever-green tree within six feet of the lens covered one-half the plate; there was also a light-coloured stone house, in sunshine, about fifty yards off, which covered a large part of the remainder of the plate. The house was not overdone in the least, and every minute leaf could be counted on the tree. If I refer to this print again here it is to say that no artifice whatever was used—no inclined diaphragm or sky-shade of any sort. There was simply given a full exposure and the ordinary weak alkaline development. Moreover, the emulsion—an ordinary chloro-bromide with two drops of *aqua regia*—had been kept nineteen days after sensitising with my ordinary excess of silver nitrate. When albumen is used in the bath there seems to be no difficulty about keeping emulsions made according to my ordinary formula. M. Carey Lea.

*Philadelphia, December* 14, 1875.

## PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

*To the* Editors.

Gentlemen,—Permit me to announce that the second annual general meeting of this Association will be held at the Co-operative Hall, 55, Castle-street, Oxford-street, W., on Monday, January 24. The concert will be under the management of Mr. E. Cocking, and the lantern exhibition under that of Mr. F. York.

Further particulars will be advertised next week. Admission (by ticket only) one shilling, which may be had on application to—Yours, &c.

18, *Kirchen-road, Ealing Dean, W., December* 28, 1875. W. F. Wilkinson.

## EMULSION DIFFICULTIES.

*To the* Editors.

Gentlemen,—In your last issue I notice a letter signed "Washed Emulsion," in which the writer asks advice in connection with a very common cause of failure in the preparation of pellicle. In your append to the letter in question you touch upon two of the probable causes, but fail to mention a third which appears to me to be at least as likely to produce the effect complained of as the other two. I allude to the practice of washing the pellicle *too soon*, or before it has properly set. The effect of this, as you have yourselves previously shown, is to subject the pellicle, on its first washing, to the action of dilute ether and alcohol, derived from the partially dried emulsion, which at that stage retains a comparatively large quantity of the solvents.

The further action of the diluted ether-alcohol mixture is to retain in solution a certain proportion of the pyroxyline contained in the sensitive mass; the most soluble portion, in fact, which is generally supposed to have the greatest affinity for silver, and which, therefore, forms the most valuable part of the pellicle. In addition to this, many of the organic silver compounds are soluble in alcohol, though not so in water; hence, another source of waste. The general effect, then, is not only to rob the final emulsion of a considerable portion of its organic matter, but also by removing a part of the pyroxyline (which is thrown away in the first wash-water) to weaken its suspensory powers, thus forming a coarse granular film.

I am aware that Mr. M. Carey Lea advises an early application of the *organifier*, but in that case the circumstances, as far as regards the silver compounds, are greatly altered. Still the principle holds good as far as the pyroxyline is concerned, and I think is proved by the fact that Mr. Lea recommends the addition to the final emulsion of a certain quantity of plain collodion *to supply the place of the pyroxyline lost in washing.*

On the subject of unsuitable pyroxyline, I may remark that a very different class of cotton is required for a washed emulsion as compared with the quality we have been accustomed to use for ordinary collodio-bromide work—a more "horny" description producing the best results. This fact was, I believe, first noticed by Mr. Houlgrave, of the Liverpool Amateur Photographic Association. The more soluble the pyroxyline is so much the more strongly does the too early washing of the emulsion militate against success.

Weak solvents either in the first or final emulsification, or the addition of too large a proportion of water in the first instance, will also produce granularity. Your correspondent having used ammonium bromide, it is but too probable he has been obliged to employ a large quantity of water in order to get it into solution, which, if the solvents were originally of low grade, would account for his failure.—I am, yours, &c.,

*Liverpool, December* 27, 1875. W. B. Bolton.

## RUBY GLASS.

*To the* Editors.

Gentlemen,—Many of your readers—especially those who work the more rapid forms of bromide dry plates—have doubtless been more or less annoyed by the nature of the light which passes through the "ruby glass" usually recommended as the only safe description to use in connection with such plates.

The inconvenience arises from the very small proportion of the luminous rays which pass through such a medium, the heat rays forming by far the greater portion of those which pass. I have accidentally discovered that, by placing *behind* the ruby glass a sheet of ordinary ground glass, not only is the illuminating power of the light very materially increased, but that the colour and quality of the illumination is infinitely less fatiguing to the eyes. Though more *light* passes through the glass it does not appear that it depends upon actinic rays, as I have proved by experiment; a dry plate placed behind a negative and exposed to this light for a quarter of an hour showed, upon developement, not the slightest trace of an image.

I can only explain the *rationale* of this action by supposing that the polished surface of the dark ruby glass forms a much better reflecting surface than ordinary colourless glass, and that thus a very much larger proportion of the illuminating and other rays are lost. By inserting the ground glass the rays are absorbed and transmitted, thus becoming available for developing or other purposes. I imagine that by grinding the surface of the ruby glass itself a still greater gain would ensue.—I am, yours, &c.,

*Liverpool, December* 28, 1875. H. A. Wharmby.

## FRENCH OR ENGLISH?

*To the* Editors.

Gentlemen,—What in the name of goodness is the meaning of the last paragraph but one (that referring to M. Lambert) in the rambling article of your anonymous contributor, "Wrecker," last week. The question as to who is the inventor of the Lambert processes requires no answer; it appears to me to cover some hidden joke, too abstruse, however, for my poor skull. But no wonder "Wrecker" is "completely mystified" in the matter if he be one of those happy individuals who believe in a "royal road" to everything, as from his next words I presume he does. Such people are generally those who expect to make up pecuniarly for their lack of brains. No wonder, then, at the mystification.

However, M. Lambert has never yet claimed that his processes make a man an artist *instanter* for the payment of a certain sum down. What M. Lambert claims to do is to place *in the hands of an artist* a method of producing artistic results with a less expenditure of time and in a less roundabout way than is usually adopted. In fact, instead of supplying brains he offers useful employment for those already possessed. Next comes what I don't know whether to set down as another *attempted* joke or to pure ignorance; but, passing on to the "style of signature" ("Lambert") so far from being the "prerogative of noblemen," I may inform "Wrecker" that it is a very common practice with the French (to which nation, by the way, M. Lambert *does* belong) to sign merely the surname without christian name or initial.

Lastly: I can satisfy "Wrecker," by informing him that *I* have seen M. Lambert, and found him not only a gentleman, but a clever and artistic manipulator; and I can only say, that if "Wrecker" should be fortunate enough to meet that gentleman, he will find him, as I did, willing and ready to give every explanation or information in his power to *licensee or not.*—I am, yours, &c., Dunham.

*Manchester, December* 28, 1875.

## EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at the small cost of one shilling in our advertising pages. This column is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

Wanted, The British Journal of Photography for 1864, bound and complete, in exchange for the *Photographic News Almanacs*, 1864 to 1872, bound and complete, in two vols.—Address, J. Warburton, Fairlie-villas, Wellington-road, Fallowfield, near Manchester.

## OUR ALMANAC FOR 1876,

EDITED BY J. T. TAYLOR,

*Will be published on Monday next, January* 3, 1876.

IN addition to the work containing the largest number of ORIGINAL articles that have ever been included in ANY Photographic Annual—articles which are copiously illustrated by wood engravings—it is embellished by MR. R. FAULKNER'S CELEBRATED PORTRAIT PICTURE—

"INNOCENCE" (DOROTHY MORRISON).

This charming pictorial work was universally pronounced by critics and the newspaper press to be the gem of the late Photographic Exhibition. The negative has been kindly lent by Mr. Faulkner, and the prints have been executed by the mechanical process of Messrs. Taylor Brothers, Fox, and Co., Victoria Works, Forest-hill, S.E.

Including text and advertising sheets the work forms a volume of 336 pages.

Price One Shilling; free by post, 1s. 3d.

☞ Agents and others are requested to forward their orders at the earliest possible moment.

## ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

NOTICE.—As numerous correspondents are very well aware, we have at all times freely given such information as we could upon every matter on which our advice or opinion has been solicited, without knowing who were our correspondents. In future, and commencing with the number for January 7, 1876, we shall require each correspondent to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a *nom de plume* as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

J. W.—We have found a copy.

MUNGO PONTON.—Received Thanks.

JUVENIS.—The name was a *nom-de-plume*.

A. H. M.—We regret that we are unable to afford the information sought.

E. O.—By judicious retouching the effect of the scar on the lady's cheek will not be noticed.

J. P. A.—The sulphur fumes arising from the pit are, without doubt, the occasion of the stains.

DON CÆSAR.—There is such a section, but with respect to it we have not yet obtained satisfactory information.

J. W. GRIMSHAW.—So far as we are aware all the three lenses named are alike in construction and rapidity.

J. DE BRUNET (San Sebastian).—Received; thanks. The parcel has been dispatched as directed. It contains the Journal required.

SARTOR RESARTUS.—Give the plate an edging of india-rubber solution all round the margin, then wet the surface with water, afterwards applying the solution of iodine, which must, however, be much weaker than you at present intend it to be.

P. A. F.—It will be better for you to stain the inside of the camera of a black colour, by first sponging it well with a strong infusion of logwood, allowing it to become dry, and then applying a solution of sulphate of iron. A mixture of glue and lampblack may also be used for the same purpose.

GEORGE BROWN.—The meaning of $\frac{f}{12}$ is that the aperture that is being used at the time is one-twelfth of the focus of the lens. If the focus were twenty-four inches, an aperture or stop of two inches would be indicated by the above symbol; if the focus were only six inches, the stop would be half-an-inch.

NON SAPIENS.—The convergence of the lines of the building is caused by the camera having been pointed upwards so as to secure the delineation of the upper portion. This, unless when accompanied by swinging the back of the camera so as to place it in a vertical position, is *sure* to cause the effect you so comically describe.

J. JONES.—Several particulars respecting the nature of M. Leon Vidal's method of polychromic printing will be found in an article by Mr. J. R. Johnson in our ALMANAC for 1876, to which we refer you. We have never seen any specimens of M. Vidal's work except one of the first attempts made, and which we received from the late Mr. Sutton nearly three years ago.

REV B M'D.—The statement is scarcely correct, all substances radiating their heat in every direction. The rougher the surface is the more freely will the heat be radiated. Ether possesses greater transparency than water to the thermal ray, the latter allowing eleven per cent. to pass, while the former allows twenty-one per cent. The best thermal lens that can be constructed ought to be made of rock salt.

B. M'MURDO.—The camera you suggest is certainly ingenious; but we point out two features in connection with it which appear to be unrecognised by you. First: if the camera be placed upon a stand of the ordinary height, it will be necessary that the operator should stand upon a low stool to enable him to *look down* with comfort upon the ground-glass frame in the top of the camera. Second: the camera you propose is not novel, for it was made the subject of a patent by the late Mr. Sutton several years since.

J. B. DOBSON.—Having both ample space and means at your command we advise you to make the studio of the largest dimensions given in your plans. The proposed camera will be quite large enough, but with a lens to match it will be somewhat costly—certainly not less than eighty pounds. A lithographic press of the usual construction will answer for photolithography quite as well as the modified form named. It would be advisable to obtain a few lessons in the practical details of lithographic printing.

S.—The diameter of the lantern condensers must be a little larger than the negative to be enlarged. This will be obvious when it is considered that all the light that passes through the condenser does so in the form of a cone, by which the diameter of the portion of the negative to be magnified is limited. Four and a-half inches form a useful diameter for a condenser. The reflector must be spherical, and it should be carefully adjusted with respect to its position. We are unacquainted with the lamps or photorama mentioned.

"IN A FOG."—Try a collodion that has been rendered of a very deep sherry colour by the addition of tincture of iodine; or, into half-an-ounce of collodion drop a small bit of iodine, which will be immediately dissolved. With this prepare a plate, using the same developer as before. We believe that the fogging complained of will not now be seen; but at anyrate this experiment will decide the matter as to whether it is the collodion or the bath that is at fault. Should the fogging still continue, then you must make a new developer, using an entirely different sample of acetic acid from that previously employed.

ST. ASAPH.—It is very difficult indeed to photograph a person in the act of singing so as to preserve a natural expression. Some people, even when engaged in emitting strains of the most jubilan kind, accompany the vocal utterances with a facial expression so painful to contemplate as entirely to mar the effect intended; and if such an expression were caught by an instantaneous camera exposure, it would convey any idea other than that of a "jubilee" singer. Let your intending "subject" practise before a mirror for some time, so as to be able not merely to evoke a pleasing, musical expression on the face, but also to sustain that expression for a length of time sufficient to permit a good negative to be secured.

H. D. S.—We had quite forgotten the fact of nitrate of uranium having ever been used as an addition to the toning bath until we received your second letter. On referring to an old note-book, we are enabled to give you the formula used fifteen or sixteen years ago by a few photographers in America. The advantage alleged to arise from its use was a great degree of delicacy in the whites, the shadows being of a bright, rich purple. Let the following solutions be prepared:—

No. 1.

Chloride of gold ............................... 4 grains.
Water ............................................ 2 ounces.

No. 2.

Acetate of soda ................................ 50 grains.
Water ............................................ 1 pint.

No. 3.

Nitrate of uranium ............................ 2 grains.
Water ............................................ 2 ounces.

Mix together Nos. 1 and 2, and shake well; then add No. 3, and again agitate. A little chalk is added to neutralise any acid. The usnal hypo-sulphite-of-soda bath is used for fixing.

RECEIVED.—Cussons' *Pocket Almanac.*

☞ Editorial Communications should be addressed to "THE EDITORS"—Advertisements and Business Letters to "THE PUBLISHER"—at the Offices, 2, York Street, Covent Garden, London, W.C.

## MEETINGS OF SOCIETIES FOR NEXT WEEK.

| Date of Meeting. | Nme of Society. | Place of Meeting. |
|---|---|---|
| January 3 .... | West Riding of Yorkshire .... | Victoria Hotel, Bradford. |
| " 5 .... | Edinburgh .............. | The Hall, St. Andrew-square. |

## METEOROLOGICAL REPORT,

*For the Week ending December* 29, 1875.

Observations taken at 406, Strand, by J. H. STEWARD, Optician.

THESE OBSERVATIONS ARE TAKEN AT 8.30 A.M.

| Dec. | Bar. | Wind. | Wet Bulb. | Dry Bulb. | Max. Tem. | Min. Tem. | Remarks |
|---|---|---|---|---|---|---|---|
| 23 | 30·15 | NW | 42 | 45 | 52 | 43 | Raining |
| 24 | 30·28 | W | 45 | 48 | 47 | 43 | Raining |
| 25 | 30·27 | NW | 43 | 43 | 49 | 41 | Fine |
| 27 | 30·54 | SW | 47 | 48 | 49 | 46 | Dull |
| 28 | 30 55 | W | 42 | 45 | 48 | 43 | Dull |
| 29 | 30·43 | W | 43 | 45 | — | 43 | Dull |

CONTENTS.

# INDEX.

# CONTRIBUTORS.